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MARCH 15, 1984

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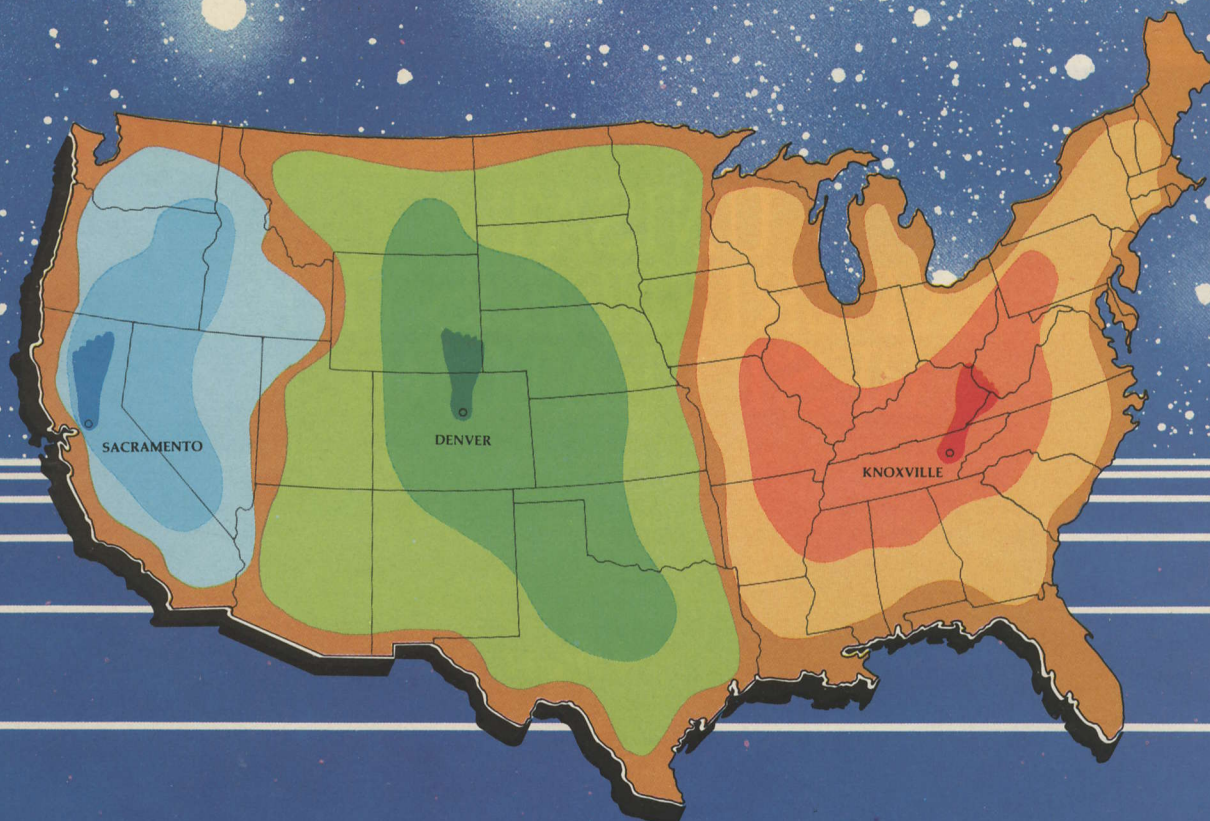
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MARCH 15, 1984

**CONVALESCENCE**

The worst seems to be over, the fever has broken and the patient is on the road to recovery. It was touch and go for several weeks.

**SPACE** had its guts ripped out by a savage attack launched against both its internal organs and its body skin. Organs were set against organs, limbs against limbs and for a period of time in mid-February there was serious doubt that the patient would pull through.

A group (meaning two or more) of viruses attacked **SPACE** all at the same time. They went after **SPACE**'s 'heart' first, the one-man-band that has to date kept the body-**SPACE** tuned up and ready to respond in time of need. With the heart under attack and reeling from infection, they then attacked some of the closer-in body parts. The 'head' and brain was consumed by fear and within days the body temperature was dangerously close to permanent damage.

**From the outset** it was clear that the viruses attacking **SPACE** intended to do permanent damage to the heart, although it was never clear that the remainder of the body was in direct jeopardy. The body-**SPACE**, represented by the Executive Committee, went into action late in February to survey the extent of damage done. First the patient was subjected to a thorough examination; just how severe was the illness? The initial diagnosis was not encouraging; even with recovery, the heart would suffer permanent damage. A 'By-pass' operation was recommended to separate the heart from the balance of the body and to restore the normal flow of blood to the outer extremities.

A full 'work-up' was completed; every aspect of the illness was checked and re-checked by the Executive Committee medical team. Their decision?

- 1) **A new General Manager** would be hired immediately. Fortunately several exceedingly qualified candidates were waiting in the wings, ready as 'organ donors' to put the ailing

patient back onto its feet.

- 2) **A change in climate was recommended;** the **SPACE** 'patient' would be moved from its present home to a new home nearby.
- 3) **There would be tighter controls** on the full operation, more daily monitoring of the 'patient' and a better flow of communication between the Executive Committee 'medical team' and the body-**SPACE**.

**Translation?**

**SPACE** has just gone through a very difficult re-organizational period. Internal structures, created in a period gone by, have been redesigned to reflect a maturing trade association. General Counsel and Vice President Richard L. Brown is being joined by a new General Manager for the trade association. The new GM will hold the title of Vice President and he will report directly to the Board and Executive Committee.

**Those who would have had Brown totally eliminated from any **SPACE** activities did not win** but their attacks and their citations of 'conflict' were very important in helping the Board of Directors, the Executive Committee, and the industry as a whole focus on the areas where obvious improvement in the **SPACE** internal structures was needed.

**Courtroom battles are not over;** suits and counter suits will continue with us for some time. It is difficult to turn them off as rapidly as they were turned on.

The **SPACE** Executive Committee found no foundation for charges of mishandling **SPACE** affairs, nor did it find any evidence that anyone had profited beyond the guidelines established by the Board itself. No funds were missing, nor unaccounted for. There were no overt conflicts of interests.

**SPACE is on the mend.** It needs our prayers and our support to be totally wholesome and healthy again.

COOP'S  
MID-  
MONTH  
COMMENTS



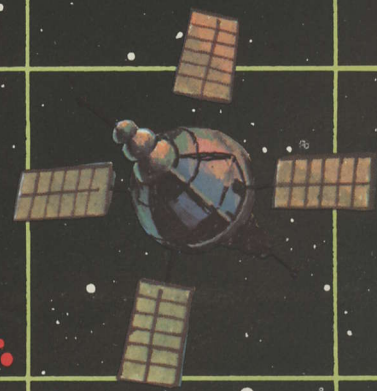
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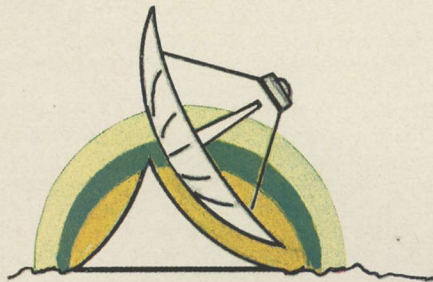
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\*\*\*\*Illustration: A Typical \$2500.00 System with 3 Year Warranty — \$65.50 Per Month

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NEW  
PRODUCTS/  
SERVICES/  
EVENTS



OMNI-SPECTRA's  
Omni-Rotor

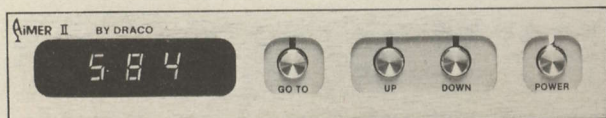


IVC's 80¢ A  
Day Plan

#### ANTENNAS/Antenna Accessories

**ANTENNA TECHNOLOGY CORPORATION** (8811 Pinnacle Rd., Suite C-103, Scottsdale, Az. 85255; 602/264-7275) has added 30,000 square feet of additional antenna manufacturing capability primarily to satisfy demand for their 7 meter Simulsat antenna system; at their Orlando, Florida facility. At the same time, ATC has completed construction on a new antenna test range for both C and Ku band antennas in Orlando and announces the antenna test range is now available for daily leasing, complete with technical personnel.

**DRACO LABORATORIES, INC.** (1005 Washington, Grafton, Wi. 53024; 414/377-0770) announces a number of newly available products for the antenna portion of the TVRO system. A new 'Gimbal Mount,' originally developed for their AIMER series of TVRO actuators, is now offered for 'other' antenna systems. The Gimbal bracket insures that actuator arm assemblies will not warp or twist while rotating, creating uneven loading on the motor drive. DRACO also has a new motor drive assembly, as a stand-alone unit. The new 18 or 24 inch stroke actuator has a totally separated sealed gear box, sealed tubes and wipers, and an anti-jamming thread design. AIMER II is a new, lower cost satellite antenna positioner with a semi-programmable power positioner. The unit has dynamic braking, and a built-in power supply.



#### AIMER II by Draco

**HOUSTON SATELLITE SYSTEMS** (8000 Harwin, Suite 397, Houston, Texas 77036; 713/784-8953) now has a Tracker IV, Tracker II and Tracker II Plus series of antenna actuator and control systems. Tracker II has a manual east and west control with limit switches to prevent over-runs. II-Plus has fast and slow control buttons, and a built-in Polarotor/Omni-Rotor control system. Limit switches are included. The Tracker IV includes a wireless remote control with interfacing capability to Drake and Luxor receivers, directly. The IV is available with, and without, the remote control portion of the package.

**KAUL-TRONICS, INC.** (Highway 14 East, Richland Center, Wisc. 53581) began shipping a new 5.5 foot stainless steel TVRO antenna in February. Originally designed for the 12 GHz (Ku) band services,

**Attention Distributors/OEMs:** CSD/2, issued on the 15th of each month, provides you with an opportunity to announce new products, services and personnel changes to the worldwide home TVRO industry. Place Carol Graba, CSD/2, P.O. Box 100858, Fort Lauderdale, Fl. 33310 on your 'press release' mailing list. Deadlines for inclusion in the dated-month of issue are the 25th of the preceding month. CSD/2 is published in the middle of each month as the 'mid-month companion' to CSD Magazine (issued the first of each month) and is distributed to all domestic (U.S.) subscribers to CSD, selected non-domestic members of the industry, and to all 'Dealer Members' of SPACE.

the firm reports, 'good performance results' on **selected** transponders and satellites with a 'sub-reflector feed system.' The antenna has an f/D of .278 (17.75" focal distance) and weighs just 71 pounds. It carries a full ten year warranty. Kaul-Tronics has also recently completed relocation of its entire manufacturing operation to the address given previously; a new 14,000 square foot facility. New toll-free numbers are 1-800-826-NOVA within Wisconsin and 1-800-826-KAUL in the other 47 continental states. Regional warehouses are now maintained in Boulder, Colorado (4919 N. Broadway; 80302) and Las Vegas, Nevada (4295 Unit D, South Arville St.; 89103).



KAUL-TRONICS 5.5' Dish

**UNIROYAL CORPORATION** (Uniroyal World Headquarters, Middlebury, Ct. 06770; 203/573-2000) has completed testing and production release for a new plastic material developed specifically for TVRO antenna system manufacture. **Rovel** is said to be a thermoplastic with exceedingly high impact strength combined with high resistance to ultraviolet rays (UV), ozone and corrosion. Rovel is now in use by Pico Satellite, Inc. (Lantana) Florida for a series of antennas from 2 feet to 14 feet in size (2 foot versions for DBS). The segments are vacuum-formed from 9 by 8 foot sheets of Rovel-capped AVS. The sheets are cut diagonally in half to create two of the eight dish segments in a typical Pico antenna. The vacuum forming is being done by Solar Plastics, Inc. of Tampa, Florida. According to Uniroyal, surface accuracy to 0.0003 inches (RMS) is possible and repeatable with the system, resulting in exceedingly high surface gain and close control of antenna system tolerances.

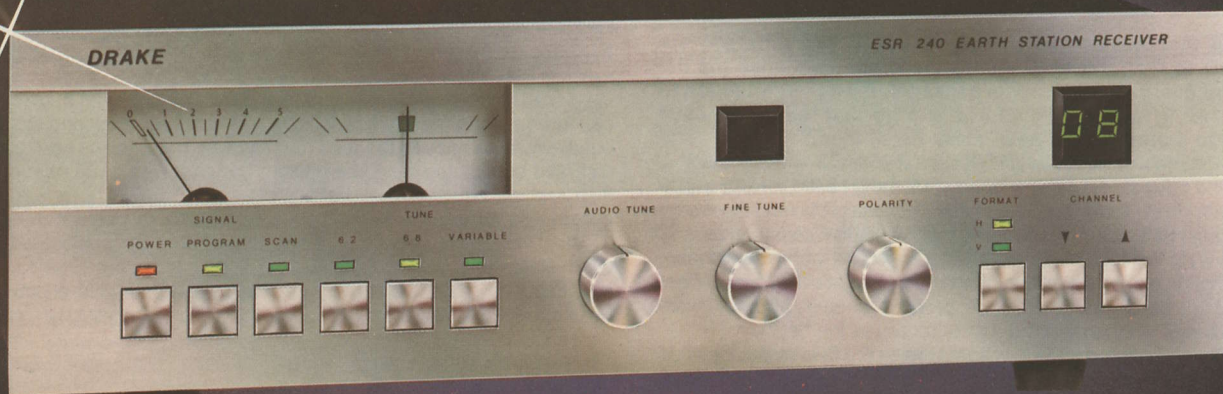
**SUPERWINCH, Inc.** (Connecticut Rt. 52 at Exit 95, Putnam, Ct. 06260; 203/928-7787) is closing out their (old style) slant-faced Sky-walker I antenna actuator and control systems for \$225 (as long as the present supply lasts). The on-sale 4150R model has only a control box **design difference** from the newer 4152 unit. A standard one-year warranty applies. At the same time, the model 4152 unit has been price-reduced to \$268, a 10 percent reduction from earlier pricing.

**SATELLITE TECHNOLOGY SERVICES, INC.** (STS 2310-12 Millpark Drive, Maryland Heights, Mo. 63043; 314/423-5560) has introduced an antenna actuator system which is capable of storing up to 30 separate satellite locations in memory. The microprocessor-based



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*REMOTE CONTROL*



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system is self-contained and can be used with virtually any existing TVRO antenna system. The user has LED displays for satellite number and position as well as front panel lights that identify the satellite, polarization and antenna position. A NiCad battery maintains memory

and the control voltage to the actuator is 36 VAC.

**U.P. SATELLITE DISH COMPANY** (1651 17.4 Road, Escanaba, Mi. 49829; 906/789-1027) has moved into a new 12,000 square foot

### NEW PRODUCT Of The Month

"There will be no basis for patent infringement." Speaking is **Bruce Smith of Omni-Spectra** and the product he is cautioning you about is the brand new **'Omni-Rotor'**, a mechanical type of feed rotation device which Omni openly compares to 'Brand C (X)' point for point right down the line.

The Omni-Spectra polarizer system was the subject of an intensive technical study in **CSD** magazine (March 1, 1984). Omni's approach to allowing the consumer to select between vertical and horizontal polarized signals has been 'different' than other polarization-switching feeds from day one. In **CSD** we found out what those differences amounted to, and what the limitations of the 'Polarizer' might be. If Omni was doing it 'their way,' why would they announce a brand new feed system based upon 'mechanical rotation.' Smith again.

**"The marketplace obviously requires two different approaches to feed systems. NO single system satisfies the demands of every TVRO terminal packager. It was our intention to be a complete feed supply source and for that reason we have elected to announce the new 'Omni-Rotor' feed."**

The Omni-Rotor is an in-line design with some 'twists.'

- 1) The drive motor system uses something called **torque multiplication**. This places a gear between the probe and the motor. Omni believes this is a better mechanical system than directly driving the probe with the motor shaft. The motor is enclosed.
- 2) The probe is **larger** than 'Brand C' and of a **differing design**. Omni says this keeps their product 'unique' and it will not infringe on the patent rights of others in the field.
- 3) The scalar feed plate is **adjustable**, in the field by the installer, for dishes from .28 to .4 f/D. This eliminates, suggests Omni, retrofitting a special part to the feed for those .3 region dishes.
- 4) The controller, scheduled to be first shown in Las Vegas at the SPACE show, uses some 'new solid state technology.' It is 'user friendly,' meaning that it will **'remember skew'** settings



OMNI-ROTOR PACKAGE from Omni-Spectra

for a particular satellite. It has a single button control and it drives forward and reverse by simply applying pressure on the switch.

Pricing? Smith again.

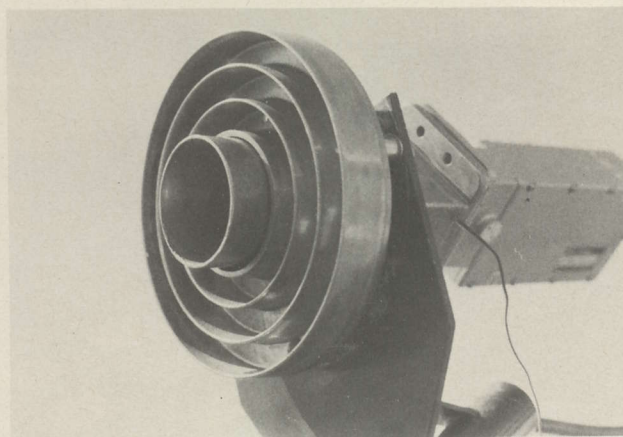
**"We are going to be price-competitive** but we do not intend to undercut the present marketplace position pricing established by 'Brand C.'" Interpretation? Omni-Spectra will price their new Omni-Rotor feed pretty much like Chaparral prices their Polarotor.

**"We intend to compete on the basis of product quality** and service to the distributor/dealer/user chain. There will be no (initial) price differentiation. The buyers used to have a single quality choice in this product area; **now they have two."**

**Performance?** Omni-Spectra dispatched an early production model of the Omni-Rotor to **CSD** in mid-February. The shipment was less the new solid state, IC-designed controller since it was not available at the time. We immediately put it to work on a test dish system.

Because the scalar plate is designed with a series of holes, you can interface the feed with just about any antenna mounting system out there. We removed the feed (a Chaparral Polarotor 1) from a test dish and substituted the Omni-Rotor. The dish was a .38 region f/D dish and we adjusted the scalar plate accordingly. **There was no detectable difference between the two feeds in performance.**

Next we took a .3 f/D feed off of a second dish and substituted the Omni-Rotor feed. The scalar plate was readjusted at the throat for the new f/D. And again, we could detect no operational differences between the two feeds.



OMNI-ROTOR installed on test dish was optimized for peak performance.

While this is the sort of quick product for product substitution which many dealers would (and will!) engage in, this type of 'testing' is not meant to be a replacement for a proper bench and test range analysis of the performance of a feed. **CSD** recently completed an extensive feed antenna 'series' in print which showed how such testing is conducted. Without access to a suitable laboratory or test range in the limited time prior to publication, we can only pass along another Smith quotation regarding specs.

**"The Omni-Rotor has VSWR and efficiency ratings equal to or better than the ratings for 'Brand C.' We intend to reduce the competition to product field quality and product service levels only and we are not leaving any room for the competition to make any claims about superior performance."**

The new feeds will be appearing at Omni-Spectra distributors as you read this. More information from **Omni-Spectra** at 21 Continental Blvd., Merrimack, NH 03054 (603/424-4111).



manufacturing facility on the outskirts of Escanaba. The firm produces screen mesh dishes from 8 feet to 25 feet and is able to create antennas in the 1,500 per month region with the new facility.

#### DISTRIBUTOR News

**BROOKS ELECTRONICS** (676 Georges Road, North Brunswick, NJ 08902; 201-828-5335) has opened a quartet of new offices. New telephone numbers are as follows: Brooks (NJ) 800-221-2491; Brooks New Hampshire 603-888-6612; Brooks West Virginia 304-766-6968; Brooks Georgia 912-233-8990, and, Brooks Florida 305-483-5879.

**CONSUMER SATELLITE SYSTEMS** has a new address and telephone number: 112 Shadowlawn Drive, Noblesville, In. 46060 and 317/845-4400. Mike Schroeder is the President.

**ECHOSPHERE CORPORATION** (2250 South Raritan, Bldg. A, Englewood, Colorado 80110; 303/935-1909) is opening a new 40,000 square foot facility for the distribution of TVRO products in Knoxville, Tennessee on the 26th of March. Echosphere now operates distribution points across the United States with the Englewood facility plus a full facility in Sacramento, California. Dave Thomas, formerly sales manager in Englewood/Denver will manage the Echosphere-East facility in Knoxville. The new facility is located at 10536 Lexington Drive, Knoxville 37922; 615/966-4114 or 800/223-1507.

**HIGH FRONTIER DISTRIBUTION** of Phoenix, Arizona has now opened a new subsidiary warehouse and sales facility at 15746 Arminta Street, Van Nuys, Ca. 91406 (800-421-8938 or 213-873-2268). In stock are products from M/A COM, Paracclipse, Janeil, Stardish, Luxor, Drake, Lowrance, DX, USS-Maspro, Chaparral, Houston Satellite, STS, MTI, California Amplifier, Microwave Systems Engineering and Transifier. Gary McNally is in charge.

**INTERNATIONAL VIDEO COMMUNICATIONS CORP.** (4005 Landski Drive, North Little Rock, Arkansas 72118; 501/771-2800) is introducing at the STTI Las Vegas show March 20-22 a new concept in marketing of TVRO receiver packages. The idea is to marry a computer based 'home energy control package' to a TVRO receiver system, and to market it so that the consumer sees that the energy savings with his 'combination package' reduces his actual out-of-pocket costs for a TVRO system to (typically) 'under 80 cents per day.'

The energy control microprocessor package will 'guarantee' to save the consumer 25% of his daily electrical costs by 'managing' the use of electricity by such units as the home refrigerator, freezer, heating and cooling system. Those 'guaranteed savings' are in turn to be 'assured' through the use of a novel 'insurance program' which the consumer receives with the packaged system. The energy savings, when applied towards the cost of a TVRO system from IVC, reduces the actual out of pocket costs for the TVRO system to the quoted '80 cents per day.' The package consists of a 'FutureVision Energy Computer' plus the IVC TVRO system, and IVC VP Dave Mullenax says that dealers handling the package will 'realize profits to \$1500 per system.'

**NATIONAL MICROTECH, INC.** (P.O. Drawer E, Granada, Ms. 38901; 800-647-6144) has opened a newly licensed division called National Microtech West, Inc. (510 29-1/2 Street, Grand Junction, Colorado 81504; 303/243-4433). President of the new operation is Jerry Johnson. Through the new Colorado facility, NM-W will distribute Apollo trademarked and manufactured products in the states of Colorado, Utah, New Mexico and Arizona.

**SATELLITE RECEPTION SERVICES/SRS** (145 Columbus Road, Athens, Ohio 45701; 614/594-2524) has been promised that it will have some of the first deliveries of the new Sky-Eye X receiver from KLM. The new KLM receiver was created by KLM engineers and is being manufactured for the California firm by Pioneer, a world leader in electronics products for the consumer electronics industry.

**SATELLITE VIDEO SERVICES/SVS** has moved to new, larger warehousing and office facilities; RD #1, Paul Saxs Road, Catskill, New York 12414. SVS handles Prodelin, Intersat, Draco, Luxor, M/A Com, Amplica, Chaparral, Commander, Wilson, Omni-Spectra and Scientific-Atlanta products as a Master Stocking Distributor.

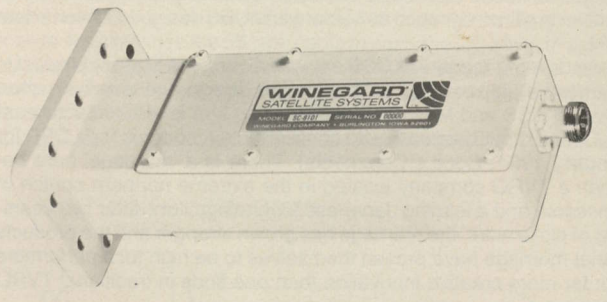
**WESPERCOM GROUP** has expanded its dealer service arm by installing toll free 800 number service in the following outlet offices: **Bend** (or) and **Redding** (Ca); 800-624-4416 in Oregon and 800-852-2202 in Arizona, California, southern Idaho and Nevada plus Utah. **Kent** (Wa) 800-346-6611 in Washington. **Coeur d'Alene** (Idaho) 800-547-0200 in Idaho, 800-543-7123 in Montana, Utah, Eastern Washington and Wyoming. **Penticon, BC** 112-800-663-4144 in British Columbia; 800-663-443 outside of British Columbia. **Vancouver, BC** 112-800-663-5955 in British Columbia; 800-663-5955 in Alberta and Saskatchewan.

The new Vancouver facility has 10,000 square feet of office and warehousing space and has been established at 1328 S.E. Marine Drive to service dealers in the Vancouver area as well as western British Columbia.

#### LNAs

**CALIFORNIA AMPLIFIER** (3481 Old Conejo Road [A3], Newbury Park, Ca. 91320; 805/499-8535) announces their new fully isolated 2 and 4 way 4 GHz power dividers are now in regular production and routinely available. The unit provides 55 dB of isolation in addition to the splitting function. Additionally, Cal Amp now offers a 'Gold Label Service' repair turn around for any amplifier which does not perform to its original specifications. For a slight extra cost, the user can specify 'Gold Label Service' and receive rapid turn-around on units; all are given 48 hour burn in before being returned.

**WINEGARD COMPANY** (3000 Kirkwood, Burlington, Iowa 52601; 319/753-0121) has introduced a new 100 degree LNA with improved input/output match characteristics. Gain is 53 dB minimum while the input VSWR is 1.25 to 1 maximum and the output VSWR is 1.5 to 1 maximum. The LNA is enclosed in a one-piece cast aluminum weatherproof housing. A 120 degree unit is already available in the product line.



WINEGARD 100 degree LNA package

#### RECEIVERS/Receiver Accessories

**BASIC SYSTEMS** (1919 South 129 East Avenue, Tulsa, Oklahoma 74108; 918/437-7066) has married a complete infrared remote controlled receiver and a dish tracking system into a single housing package. Their Model 3250 Satellite Earth Station includes 8 pre-set stereo subcarriers in either matrix or direct tuning modes. The video section has a built-in modulator and an electronic 'A/B' switch for selecting between satellite and 'other' signal sources. The tracking system operates from the remote control or from fully duplicated controls on the front of the receiver proper, and has 12 programmable 'stop' positions for commonly watched satellites. Manual east and west controls are also provided on the system. An electronic motor-stall circuit will avoid motor burn-outs. Parental key-lock-out, a built-in automatic polarization system and a video invert switch are included. The package consists of a receiver/tracker control unit, downconverter, an 18" screw jack (27" also available, optionally), a position sensor, 100 feet of cable, the gearmotor and a rainshield. Dealer pricing starts at \$1300 and works to \$1495, depending upon quantity.

**CHANNEL MASTER** (Division of Avnet, Inc., Ellenville, New York 12428; 914/647-5000) has announced a pair of new TVRO receivers.



## EQUIPMENT REVIEW / USS-MasPro SR2 RECEIVER SYSTEM

### SOMETHING OLD/New

When Doug Dehnert first displayed the **USS/Maspro** remote control **SR-1** satellite receiver at the summer of '82 SPACE trade show in Omaha, Nebraska, there were mild murmurs of interest. Dehnert's style has always been relaxed and since he was not 'pushing' the new technology on an immature industry, very few pushed back. That the SR-1 receiver was distinctively different, that it had 'more boxes' and more parts than others then (or perhaps now, as well) on the market did not escape notice. That it did anything, any better, than other receivers then available was not really an issue since the supply was extremely limited and even if everything available sold, no big bubbles would appear in the marketplace.

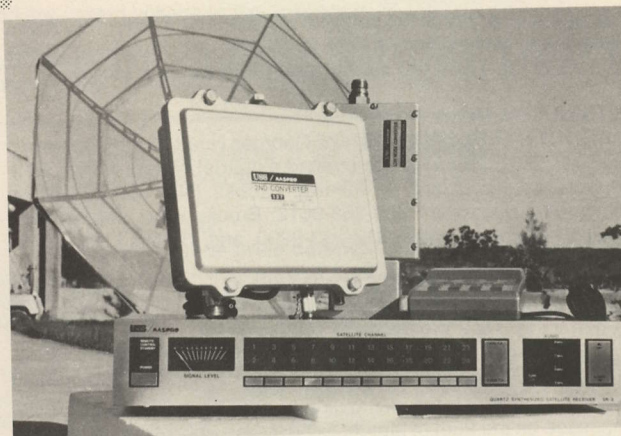
The SR-1, introduced more than 18 months ago, has withstood tests of both time and change; the basic SR-1 only very recently became an SR-2 and even with the numbering change the basic receiver is still pretty much as Maspro and USS designed it back in late 1981.

As devoted readers of **CSD** are well aware, the Maspro product is produced in Japan after a combination design and creativity effort between USS and Maspro. The Japanese firm is a manufacturer of CATV and other hardware with considerable resources (see **CSD** for **January 1984**; Coop's Comments). There is a 'marriage' here between a TVRO company located in the extreme northern portion of Minnesota and a leading Japanese technology firm. After two years-plus of close work, the marriage has grown stronger and the products of that marriage have proven themselves to be high tech performers with far more creative innovation than one finds in traditional TVRO hardware.

Dehnert, perhaps by choice, certainly by nature, is not a follower. He entered the TVRO field late in 1979; spending the winter of that year wrestling with a fiberglass dish leaning against a tree in his yard near St. Hilaire. With a background in things mechanical, and more than a passing interest in fiberglass, he began **United Satellite Systems** (USS) early in 1980. It was a gamble and it paid off.

His antenna products have always been superior (see **CSD**, page 63, July 1983 for a review of his 12.5 footer system). They have been heavier than the competition, more durable and better performing. But he was not satisfied to be an antenna OEM only, so he dug into his past and found a rich reservoir of experience in dealing with Japanese firms. Some years ago, representing an engineering division of a firm called Artic Enterprises, he was spending as much as six months a year in Japan working out the liaison problems between Artic and their Japanese suppliers. He decided to have a shot at creating a very high technology satellite receiver using a Japanese firm as the final engineering and production arm. USS thus became the first totally U.S. firm to go 'off-shore' to get TVRO product in quantity.

The SR-1 receiver is totally unconventional. There was nothing like it in the marketplace in 1982 when it first appeared; there is still nothing like it in the marketplace in 1984. At the March Vegas shows attendees will have the opportunity to see the latest versions of the product; the SR-2 line which happens to be the first significant design change from the SR-1 since the line was introduced.



The SR-1 / SR-2 receivers have four separate component units. A standard TVRO package might have an LNA, a down converter and an indoor demodulator. Or it might have an LNC plus an indoor demodulator. The SR-2 unit uses the LNC approach, but it is done differently than other receivers on the market today.

- 1) **The LNC** is a low noise down converter that mounts at the dish feed point. You attach any conventional .4 region f/D feed to its WR-229 flange just as you would with any LNA device. Only what comes out of the LNC is not amplified 3.7-4.2 GHz signal energy; it is 1.2 GHz energy. That's where the 'C' in LNC comes from; it is a frequency **converter** as well as a low noise amplifier.

By placing the first down conversion stage right at the LNA, you accomplish several things. First of all, with no coaxial cable between the LNA and the down converter, you avoid that argument of all arguments; "How much LNA gain do I need?". You also avoid having to use relatively large jumpers made of up RG-213 or RG-214 cable. Because the LNC has an output frequency well below the TVRO frequency band (1.2 GHz versus 3.7-4.2 GHz), smaller cable can be used.

- 2) Having gotten the 3.7-4.2 GHz signals away from the microwave band, to a UHF frequency band (1.2 GHz) you leave the feed with a short jumper of cable provided with the SR-2. At the rear of the dish you hang or mount the second down converter. This down converter accepts the 1.2 GHz signal from the LNC, filters and amplifies it, and then converts it to the standard 70 MHz frequency range we are all familiar with.

On the surface, without study, it might appear that the LNC is really an LNA, and that the second down converter is really the first down converter. There are no outward clues that this is not the case, except perhaps the SR-2 provided interconnection cable that links the LNC to the (second) down converter unit.

So far we may not sound like every receiver you have ever met, but we are not that unusual either.

Dehnert's concepts of what a satellite receiving system should do are constantly fed to the Japanese engineers at Maspro who in turn attempt to make those concepts turn into a viable production function. Dehnert is the first to tell you he is not an engineer; and then he launches into a detailed dissertation of 'gain blocks' and bandpass optimization which instantly gives him away. He may not have the formal training of an engineer, but he is very quick to grasp what they tell him.

One of the concepts fed to Maspro had to do with control of the various parts in the system. The Chaparral Polarotor was just getting a running start at the industry early in 1982. Dehnert wanted the first SR-1 units to take advantage of the polarization flip-flop of the Chaparral product. At the time, Chaparral was selling only a single version; using a 'game control' like black box the user could rotate a knob and make the probe swing through the vertical/horizontal arc. USS and Maspro had **other ideas** about controlling the receiver proper, as we shall see, and getting stuck with a two or three wire control circuit for the Polarotor did not seem like a very good idea. Let's see why.



Dehnert wanted a receiver which could be remote controlled. That is not unusual; that was not unusual even back in 1981. Many had **some form** of remote control even then. Dehnert's request put the Maspro engineers to work and they created a hand held remote control system which plugs into any AC outlet in a viewer's home.

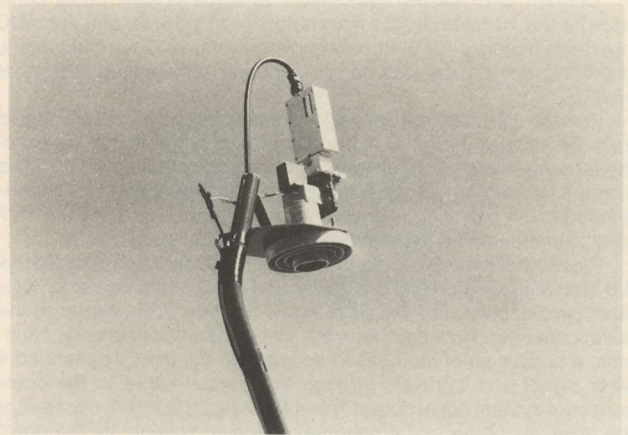
There are many approaches to remote control. Some use hard wiring (AVCOM, ICM) between the basic TVRO receiver and the remote control location. Others use Infra-red (Intersat, Drake) and still others use ultra sonic audio tones. The whole point of any remote control system is to communicate between where the viewer is, and where the receiver is. If that 'communications link' can be established, the viewer can tell the receiver what to do without actually going to the receiver.

The SR-1 brought out a remote control system which uses the 110VAC/electrical wiring circuits in the home as the 'transmission medium.' Since a typical house is all wired together anyhow, back to a common AC inlet or power service drop, there is a 'continuity' between any two AC power outlets in the building. Other electronic gadgets have used this same approach to open garage doors, turn on and off lights, start watering systems and what have you.

The 'transmitter' end has very low power 38 kHz and 114 kHz signals which are 'coupled' through an AC plug into the AC wiring system in the home. The hand held remote has a series of buttons to push, to tune the audio, change the channel, change the polarization. Each of these buttons activates a different 'pulse' of modulation which travels out of the hand held remote on the 38 or 114 kHz carriers. This carrier is, in turn, transported throughout the house to all of the AC outlets. Into one of these outlets it finds the SR-1 (2) receiver plugged in. The receiver does two things when it plugs into the 110 volt AC:

- 1) **It obtains the power** it needs to operate, and,
- 2) **It monitors the power line** for any 'signals' coming from the remote hand held transmitter.

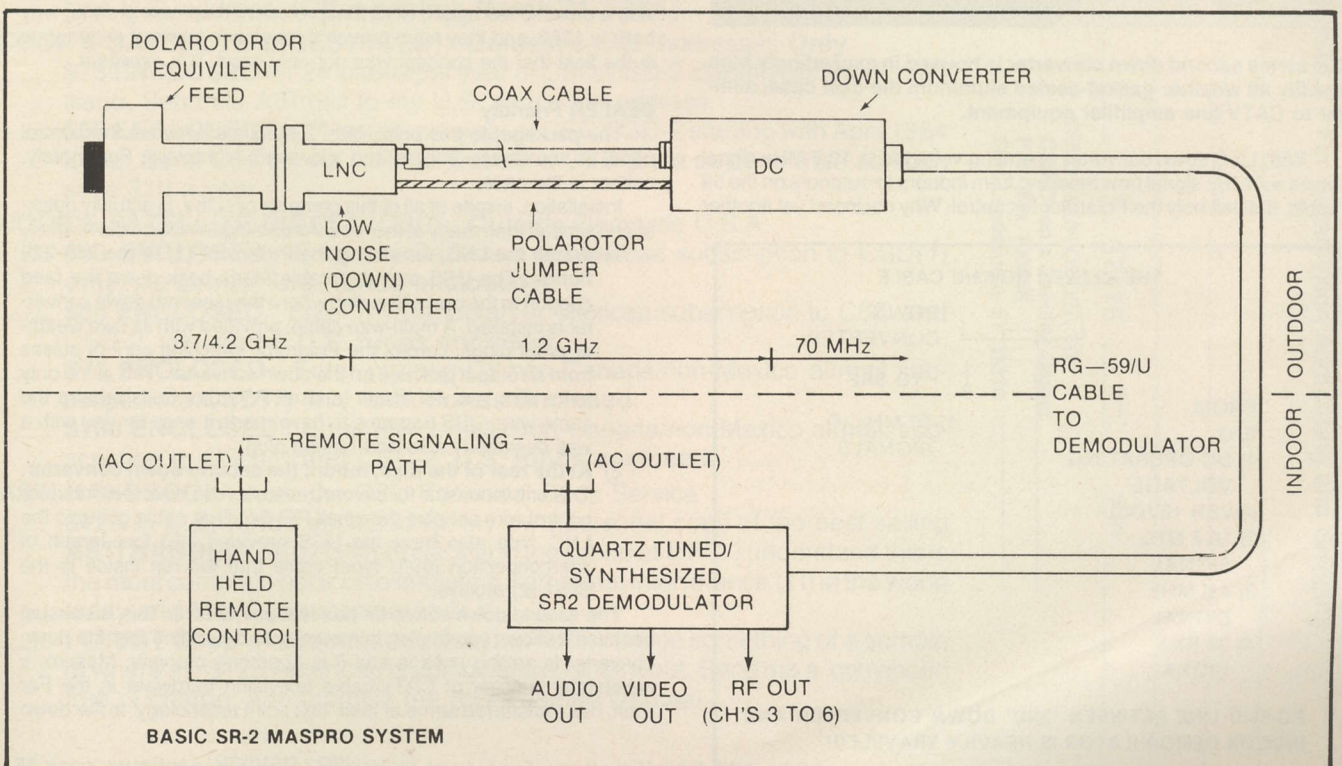
The beauty of this system is that you can take the hand held remote with you anywhere in the building; you are not restricted to simply the satellite receiver room where your infra-red control can 'see' the satellite receiver or where your ultra-sonic system can transmit a sound to the satellite receiver. It was, in 1981, a bold new step and in 1984 there are still few remote packages that have such versatility.



**SR-2 LNC UNIT bolts to antenna's prime focus feed and interfaces with Polarotor 1 unit.**

Now if the whole system was built around the concept of ultimate-freedom for the viewer, within his home, it would obviously not do to have a pair or trio of Polarotor type wires back at the satellite receiver proper. This was the primary reason why USS wanted the Polarotor to 'toggle' between vertical and horizontal, automatically, when the viewer operated the hand held unit. If the SR-1 had eliminated extending the Polarotor control wires all over the house to gain full control over polarizations, why not take a new look at running the Polarotor itself from the SR-1?

Maspro engineering had already figured out how to use the normal **5CFV** type cable which interconnects the second down converter to the indoor receiver for several functions. Multiple use of this cable for control functions is not totally unheard of in the industry; many receiver suppliers use the 59 type cable to carry the (70 MHz) IF signal **from outdoors to indoors** while at the same time sending either down converter operating voltage and/or receiver tuning voltage **from indoors to outdoors**.

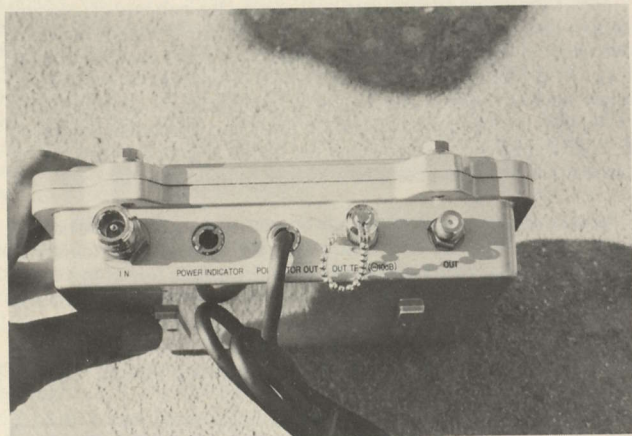




Dehnert and Maspro reasoned that if the coaxial cable could transfer the 70 MHz signals from outdoors to indoors, and carry DC operating voltages for the down converter and LNC from indoors to outdoors, why not get it to do several other simultaneous things as well?

For example, why not send an automatic frequency control signal from the indoor receiver to the outdoor down converter; to 'stabilize' the receiver and prevent drift? They did this by creating a 10.7 MHz signal indoors, modulating that signal with a voltage which corresponded to the condition of the AFC 'loop' and then sending the 10.7 MHz signal outdoors through the same coaxial cable.

Pleased with those results, they went a step further and created a 4.0 MHz signal inside of the receiver and using some crystal synthesizer circuits they sent a control signal on the 4 MHz carrier to the down converter. Now each time the viewer decides to change channels, a special bit of modulation appears on the indoor generated 4 MHz signal and it travels through the coaxial cable to the down converter system out of doors. This 4 MHz signal is in turn decoded at the down converter and it becomes a 'tuning voltage' for the down converter. So not only is the SR-1 'remote controlled' within the house, from channel to channel, by the hand held remote, but the outdoor down converter is also remote controlled as well.



SR-series second down converter is housed in exceedingly high quality all weather gasket-sealed aluminum die-cast case, similar to CATV line amplifier equipment.

With LNC/down converter operating voltages, a 10.7 MHz signal and a 4.0 MHz signal now traveling from indoors to outdoors on the 59 cable, that left only the Polarotor to control. Why not insert yet another

'signal' on the coaxial cable line; a 'pulse signal' which would 'toggle' the Polarotor clockwise or counter clockwise as the user selects even or odd transponders with his hand held remote control.

What we have here is a 'train of remote control circuits' and functions. The user wanders about the house with his hand held remote, telling the receiver when to change channels and when to re-tune audio and change polarization. In 1982, this was some pretty sophisticated stuff. It is no less impressive in 1984.

#### NO Fine Tuning

Many home style receivers suffer because when the user changes channels with **anything but** a continuously tuned receiver dial (i.e. AVCOM 2 series), you may change channels alright but the picture is still slightly 'out of whack.' Many receiver designers give you an extra knob to adjust when this happens and they call it, appropriately, 'fine tuning.' It took the TV receiver industry twenty years to figure out how to eliminate fine tuning from TV receivers. The SR-1 did it in 1982.

The literature, and indeed the front of the receiver, tells you it is 'Quartz Synthesized.' To the novice, that may seem like a description of artificial rocks. Engineers have known for some time that the best frequency control is 'crystal frequency control' (see CSD's discussion of modulators, **page 8**, February 1984). A crystal controlled oscillator, whether in a modulator or in a receiver, will be time and temperature stable long after a more conventional 'free running oscillator' has drifted into the next channel or county. Maspro engineers decided that if the user was going to have the hands-off ability to remotely control the receiver from anyplace in the home where he had an AC outlet, the consumer-friendly receiver could not be drifting about from channel to channel. No fine tuning should be required.

To make this work, you need two things:

- 1) The receiver's oscillator circuit(s) must be extremely stable. It cannot be adversely affected by how long they are 'on,' nor by what their temperature might be.
- 2) When there is drift, for whatever reason, that drift must be instantly recognized so that automatic frequency control circuits can automatically and electronically readjust the receiver's oscillator(s) to the proper frequency.

A crystal (synthesized quartz system) approach, as a stable, time-independent and temperature-independent reference system, was a must. Once again, USS/Maspro opened up new ground, way back in 1982, and they have proven through two years of experience in the field that the concept was not only good, it is excellent.

#### DEALER Friendly

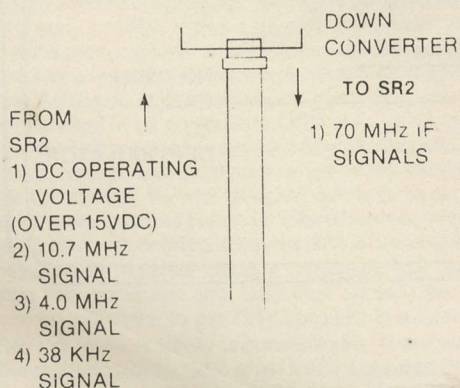
The package, to this point, falls someplace between the control panel on the Space Shuttle and a dealer's nightmare. Fortunately, neither is the case.

Installation, in spite of all of this complex circuitry, is actually quick and simpler than many of the receiver packages now on the market.

- 1) **Install the LNC, mounting the Polarotor (1) to the WR-229 flange.** The USS provided cable feeds back down the feed support to the rear of the dish where the (second) down converter is installed. A multi-wire cable, provided with its own weather proof plugs, carries the Polarotor switching control pulses from an output jack/line on the down converter. This is the only extra wire you will install (and all Polarotor units require the same wire; USS happens to have made it easy for you with a well designed cable and mating plug).
- 2) **At the rear of the dish, mount the second down converter.** This unit is unusual for several reasons. You have the Polarotor control wire set plus the small RG-6/U type cable going to the LNC. You also have the USS provided 120 foot length of interconnection (59/U type) cable that will run inside to the SR-1 (2) receiver.

The second down converter has test points on it. This is unusual because it allows you to plug in metering to determine that the down converter is getting voltage and it is operating properly. Maspro, a substantial supplier of CATV/cable television hardware in the Far East, has transferred some of their 'test point technology' to the down

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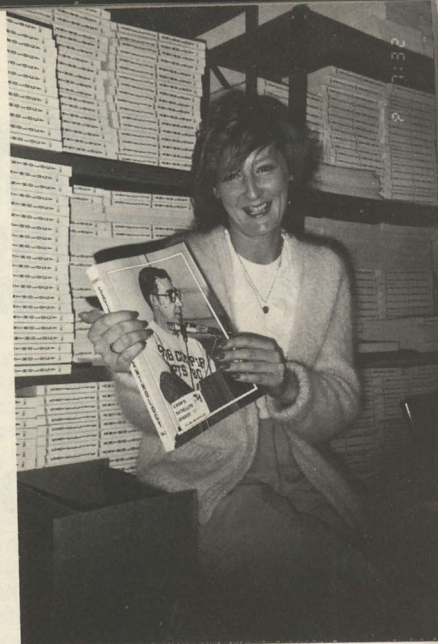
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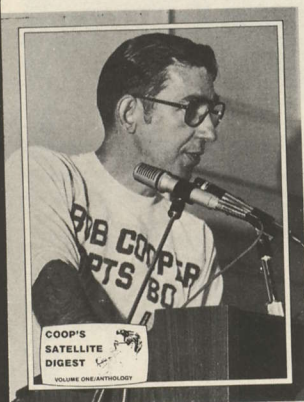


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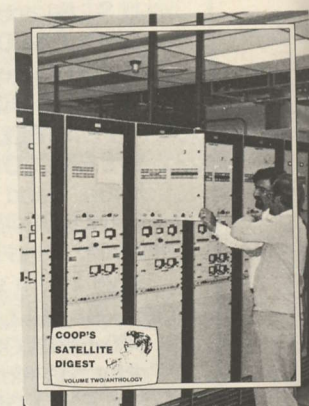


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## SR2 REVIEW/ continued from page 12

converter. This makes the unit more dealer-service friendly than perhaps any TVRO down converter on the market today.

- 3) **Connect the indoor end of the 120 foot** (or other length; USS provides 120 feet) of cable to the back of the SR-1 (2) receiver. Connect a second length of RG-59/U to the customer's TV receiver, tune in a channel between 3 and 6, and turn the system on.

While the unit comes standard with the AC line coupled remote control, you also have full control over the receiver system with the push buttons on the front panel of the receiver.

- 4) **There is only one simple adjustment for the dealer to set up;** on the rear of the receiver proper are two plastic extensions which allow you to properly 'null' the Polarator on vertical and horizontal transponders, for your location.

At that point you can take off all over the house and if the satellite receiver is connected to two or more TV sets through an in-house cable system, you can control all of the important functions from some distance away.

So in spite of the complex and frankly highly sophisticated circuits in the package, there is probably less for the dealer to do in installing the system and 'setting it up' than with virtually any other system on the market today.

That all of this was worked out early in 1982 is something quite amazing. That it has endured in the marketplace, working out the inevitable 'bugs' that all new electronic designs have, is worthy of note.

#### OPERATIONAL Points

Although we first saw the SR-1 late in the summer of 1982, we did not have the opportunity to evaluate one, hands-on, until late in May of 1983. Doug Dehnert brought it with him when he came to the Turks and Caicos hauling a 12.5 foot USS dish.

"Will you write about it?" he asked as we watched the pictures on the screen. We had just completed installation of his dish, and we were checking back and forth with an AVCOM brand receiver.

"Did you bring it down here for a CSD review?" we asked. **"No, I brought it down to see if you really did have a superior testing situation, as CSD keeps telling me. And I wanted to see how well it would work against a bench full of competitors."**

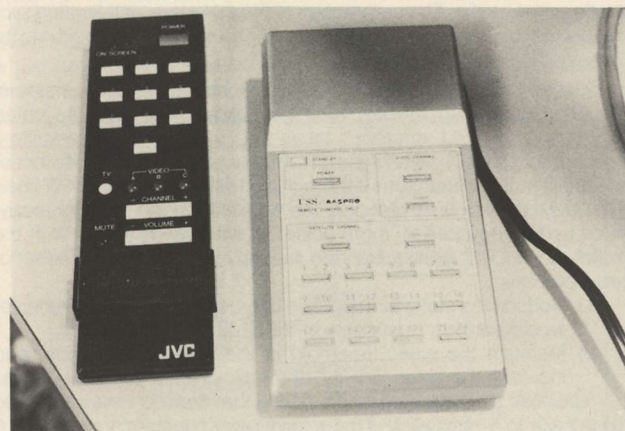
We agreed not to write about it because Dehnert was able, using our test facility, to 'confirm' something he had suspected. In spite of modern everything, the pictures remained a tad on the grainy side. We doped out why and he went back to Maspro with the results. In a strong footprint area, the pictures did not appear grainy (unless you had the SR-1 connected to a very small dish). In our Caribbean footprint region, the pictures had a definite grain to them. Not sparklies, not even baseband (video) noise. The noise was coming from an intermediate stage in the receiver. We suspected the 1.2 GHz (1200 MHz) IF.

Seven weeks later Dehnert was back to us. **"We found the problem; actually, we had too much gain in our 70 MHz section. We fixed it."** A new receiver would be shipped down to the Turks and Caicos and **this time** it would be for editorial evaluation.

At about the same time the fix was being applied to the SR-1 units, a second engineering effort was about to bear fruit. Having seen the performance at the STTI Las Vegas show in March of 1983, of the now fabled 'Linear PLL Circuit,' Dehnert was intrigued with what might be done to the ultimate sensitivity of the SR series receivers. The basic information was transferred to Japan and Maspro went to work.

What Maspro found, after months of careful study of the Linear PLL approach, was that while the Las Vegas demonstration in 1983 was impressive, perhaps there was a better way to get 'below threshold performance' with the Linear PLL approach.

The SR-1 uses a 26 MHz wide IF. This is important because many of the receiver suppliers try to make their receivers work better on low threshold (weak) signals by narrowing up the IF bandwidth. The SR-1 used a 26 MHz wide SAW filter, which is the pure engineer's approach to getting both high selectivity and extremely pleasing color bandwidths through a receiver. However, as others such as Arunta have



**AC POWER line coupled hand held remote control extends the operating range of the receiver to virtually any location on the premises.**

discovered, when you maintain a fairly wide IF (30 MHz for example), you invite dealers and customers to look at the picture and say, "The color is fantastic but the sensitivity stinks." Of all of the 26 MHz wide IF's on the market today, the SR-1 appears to have the best sensitivity. But there are those who would suggest that the average viewer would rather have less noise and slightly smeared color than more noise and fantastic color. That's why we see so many receivers around with 22 MHz IFs (i.e. the Baby-Q from Intersat). Dehnert, and Maspro, were determined to break that circle.

#### The brand new SR-2 is their product evolution in this area.

What it does is take the 70 MHz IF signal in from the second down converter and then it shifts it upwards in frequency into the 400 MHz region, inside of the receiver proper. This is the opposite approach others playing around with the below-threshold Linear PLL circuit have taken. It apparently has paid off because now they appear to have the best of both worlds; a 31 MHz wide, high definition, excellent color fidelity picture coupled with the sensitivity of a Linear PLL demodulator which is working at a quite high frequency.

The evolution of the perfected product has followed this sequence. The SR-1 offered all of the user features we have today in the SR-2. In between, there was an SR-1 which cleaned up the excessive 70 MHz gain problem (the SR-1A) and an SR-2 which added an automatic video gain control circuit to the modulator/baseband outputs. The video level control is typical of the Dehnert/Japanese approach to 'fine tuning' the product's performance. Dehnert had noticed that the picture content dramatically affected the 'depth' of the video. Depth is that function which contributes to the modulation changes within the video you see. A video picture with 'good depth' maintains distinct transitions between similar colors (or hues of colors) resulting in a more colorful, natural, display. Getting that kind of performance required that as the picture content changed, the modulation percentage **not change**. A handful of commercial modulators accomplish this with a 'white limiting' circuit or 'APL' (automatic picture level) circuit. Dehnert wanted SR series receivers to have the final bit of 'snap' to the picture.

A team of Maspro engineers has been working on modulator circuits and systems for more than a year. In fact, in Las Vegas USS will first-show a brand new SMATV/CATV grade modulator which gives the user dip-switch control of the modulator's output channel to any low, mid or high band TV channel. In the process of developing this new line of commercial modulators, they took a hard look at the way their channel 3 to 6 modulator inside of the SR-1A receiver functioned. The automatic picture level control circuit or video AGC was incorporated into the TVRO receiver and it thus became the SR-2.

The USS receiver, like so many in the field, has been dependent upon the 564 phase locked loop for the demodulator. This also bothered Dehnert and Maspro since the 564 was becoming increasingly difficult to locate (see **CJR** for **January 1984**), and, the designer



could never get the last tenth of a dB of picture quality out of a 564 no matter what he did. The parameters of the 564 were 'self-limiting'; you simply reached a point where you were fighting limitations built into the 564 itself.

Just as you are reading this, USS is beginning to ship a version of the SR-2 **which no longer uses the fabled 564 chip**. As noted previously, the LPLL approach takes the 70 MHz IF and re-shifts it upwards into the 400 MHz region. The linear phase lock circuit processes the signal and then runs it through a **31 MHz IF** using a SAW filter. The 31 MHz wide IF is probably the widest IF in the industry today. Wide usually equates to 'more noise' as we already know. With the switch to the LPLL circuit, Dehnert saw an opportunity to go either of two directions:

- 1) Reduce the static threshold on the receiver so that the receiver would perform on signals in the 7 dB CNR region, **or**,
- 2) Maintain the static threshold in the 8 dB CNR region, and increase the video 'fidelity' of the picture the consumer sees.

He chose the latter approach, noting that there is always room to 'back track' to a narrower IF if there develops a substantial market for 6 to 7 dB CNR receivers; such as 'off-shore.'

**"We could keep the same video fidelity as we had with the SR-2 or SR-1 and lower the threshold if we went one direction. I felt our threshold was equal to the best on the market already, and having a slightly more sensitive receiver was not as important to us as having a receiver which had significantly better video quality. I therefore chose to take advantage of the additional LPLL sensitivity, and broaden the IF back out again. I wanted a picture which had no tearing, no smearing, and absolutely brilliant studio display qualities even on a big screen (projection) system."**

The Dehnert/USS and Maspro philosophies differ from many in the industry. They are more akin to Clyde Washburn's approach to engineering; you don't rush out a new receiver every six months; rather you keep the well engineered basic receiver and you make 'production changes' in it as component parts change and circuit ideas mature.

#### MARKETING Philosophy

USS approaches the TVRO marketplace in a direct, straightforward fashion. They have regional distributors (such as **Recreational Sports & Imports** of Idaho Falls, Idaho). As a dealer, you buy from your regional distributor. Dehnert and crew police the distribution network very closely, perhaps something they have learned from their Japanese engineering and manufacturing liaison at Maspro.

USS provides a multiple-day school for new dealers with technicians and the dealer is given a thorough indoctrination in all of the various service aspects of the receiver package. Getting two days of hands on training with a product such as this equips the dealer to be totally in control in the field and it is a concept which others would do well to emulate.

Although all of the fall-of-1983 USS/Maspro product was 'spoken for' weeks and months before it was available for shipment by USS, increased production schedules at Maspro during the first half of 1984 will make the package available to a wider region of the country. Most of the units end up spread between Washington/Oregon and Michigan, across the northern tier of the country. There is one major distributor in Texas handling the product as well as the USS high quality fiberglass antenna line in that region of the country.

Most dealers, who never bother to check such things out, are under the impression that the USS/Maspro receiver is a trifle expensive. It is certainly not the least expensive package on the market, but when you realize that you are getting an LNA/receiver/polarotor/remote control package all in one shipping carton, complete with all cables and connectors, it turns out that there are many offering far less product for far more dollars.

#### PRODUCT Evaluation

Another publication, slanted at consumers in the field, recently wrote that the SR1 **... is the finest consumer satellite receiver reviewed to date ...**. Those are strong words in a competitive

marketplace. Our own findings, with a stack of SR-1A, SR-2 and the newer SR-2 LPLL version receivers to work with, **agree**. Evaluating a receiver for ultimate sensitivity is not difficult, even if you lack test equipment. Given a range of transponder input signal levels, you can 'see' the difference in performance down to 0.5 dB CNR increments. However, rating a receiver for color purity, picture 'snap' and fidelity is quite another matter. **There are ways**, given sophisticated video test set instrumentation and a knowledge of what the uplink is really doing with the video, to 'measure' these features. For most of us, video quality becomes a 'subjective' analysis. **We could see the difference** between the SR-1A, and the SR-2 (LPLL) for example, and we think you will be able to do so as well.

The advanced design features of the SR1/SR2 units are ahead of just about anything else in the marketplace today. We have to marvel, to the point of repetition, that all of this was actually done in fundamental form in the spring of 1982; more than two years ago. A user/dealer/design engineer could argue about the virtues of using an AC power line remote control or dual down conversion systems and probably make a strong case for other engineering approaches. But when you realize that this particular package has been designed to do just about everything that anyone does, **automatically**, it is clear that Maspro is ready in the marketplace with a superior product design while many others are still trying to figure out how to get rid of fuzzy pictures that require the customer to fine tune the receiver after each channel change.

We have to also admire the approach taken by Dehnert and Maspro to refine the basic product so that the performance constantly improves. The Linear PLL approach, certainly a topic of considerable controversy one year ago, is now in regular production in a high grade home TVRO receiver. How well it works, to extend thresholds in low signal levels, remains to be proven on a wide scale. If we can judge the innovation by the other efforts to date by Maspro, it will be a pace setter.

There are but two areas which we believe could see some further refinement.

- 1) When you place the receiver system into standby (by operating a standby switch on either the remote or the unit proper), the receiver stays tuned to the last transponder (and last audio subcarrier frequency) selected. Living in an area where there are power outages on occasion, we noticed with some dismay that when there is a power outage, the receiver resets to a 'neutral' position. This requires the user, when turning the unit back on, to re-find both his video transponder **and** audio subcarrier. A standby battery, small, to maintain 'memory' when the power goes off, for say an hour or so, would be a nice touch.
- 2) The back of the SR1/SR2 receiver has a 'Satcom/Westar (Galaxy)' switch. You will recall that because Satcom and Comstar use horizontal transponders for even numbers (and vertical for odd), and Westar and Galaxy reverse the process, you have a situation where changing birds requires that you change which numbers (odd or even) correspond to which polarization. The theory probably is that since the USS system does not provide an integrated dish and drive (i.e. such as the Intersat IQ 160), the user will have to go to where the dish controller is located to change satellites. Chances are the dish controller will be located next to the SR1/2 anyhow. While you are there, you could flip the back apron switch from one to the other. This needs to be re-thought out, and the full switching brought to both the front panel as well as the hand held remote.

There is one final example of how and why the Maspro engineers have achieved a receiver package which does just about everything the sophisticated consumer would want done, without making him turn into an operations engineer in the process.

On the back apron there is a 'wide and narrow' audio switch. When you first hit the switch, you wonder if it is working. Tuning in say a narrow subcarrier FM music service on TR3 of F3R reveals that the sound is only **slightly changed** when you switch from wide (the normal operating position) to narrow. Other receivers (i.e. AVCOM 2 series) have a very dramatic change when you toggle this function.

We wondered why, and asked. The answer is that the receiver does its wide and narrow filtering 'electronically' with an Op Amp



device rather than passive filters used by others. **The circuit actually adjusts** to the width of the signal being received, **automatically**. The user cannot screw up and leave the switch in the wrong position because the unit senses the format width and does the adjustment without attention.

## EQUIPMENT REVIEW / HERO SCPC Narrow Band RECEIVER

Last month we looked at the basic differences between receiving a wide band (i.e. full transponder-width) TV carrier with its associated subcarrier audio signal(s), and receiving a relatively narrow band FM/SCPC signal using the sFMs format. We came to the conclusion that you cannot use a standard TVRO receiver to receive these stand-alone network radio or data signals, that a special receiver designed from the ground up for this service is required.

We also discovered that there are really two different approaches to sending 'narrow band' voice or data material via satellite; one system uses single sideband (SSB) with very-narrow bandwidths (suitable for voice and relatively slow data) while another uses a slightly wider frequency-modulation system. The FM system is akin to the standard FM broadcast radio service we have in North America in the 88-108 MHz band, except that it is distributed within the 'secure' confines of a satellite transponder dedicated to just this type of service. We also learned that there are concentrations of this 'FM' format satellite networking on birds such as Westar 4 (TRs 1 and 3).

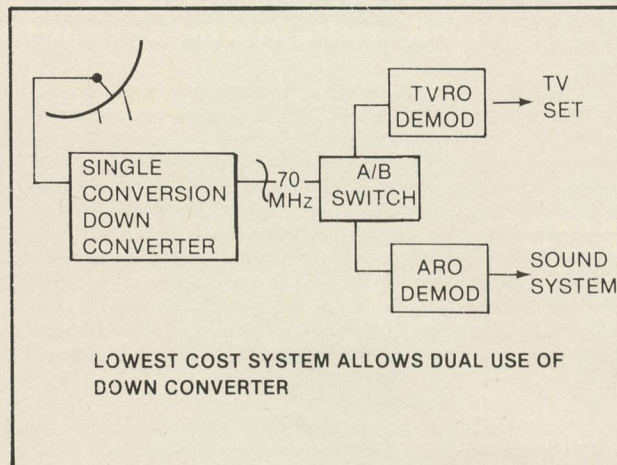
A brief recitation of the various types of services available is in order. All of the major radio networks now use sFMs or FM/SCPC to inter-connect their affiliates with the basic news, special events and programming feeds. That includes ABC, CBS, Mutual and NBC as well as the Canadian networks. Overseas, virtually all of the satellite-using nations use FM/SCPC to interconnect their national radio networks. Even the Voice of America and the BBC use satellite FM/SCPC to send their programs overseas to terrestrial AM or shortwave transmitters.

There are many-many regional radio networks also using satellite networking; Florida, Georgia, Minnesota, Texas, Arkansas are but a handful of the state networks now using satellite to send statewide newscasts to affiliated stations. The major news services (AP, UPI, Reuters, etc.) all use the same technique to send both radio (audio) news services and Teletype® or machine-copy news services to affiliates. There are Spanish language radio networks and there is the official (US) Naval Observatory time source service. The list is quite endless.

The market for this equipment has been mostly professional to date; radio stations, of course, newspapers, and others in the news dissemination business. During the past 12 months the number of services using sFMs for program distribution has doubled and a

\*/ This issue of CSD/2, **the first in this format**, replaces the mid-month publication CJR originally created by West Indies Video as the publication for dealers in the industry. Readers receiving CSD/2, not previously readers of CJR, may call or write CSD/2 for a copy of the February issue of CJR (containing part one of this two-part series).

Many of the features found in the SR1/2 are found in other receivers. None have them all, however, and with an entire new breed of receivers coming on line over the next sixty days, it will be intriguing to see just how other innovative designers handle the many complex operational functions found in the SR1/2 units.



similar growth is expected during 1984. This is truly a fast growing aspect of the satellite distribution world.

In the February CJR(\*) we learned how a basic system designed to receive FM/SCPC service differs structurally from a basic TVRO system. From that we saw that the only real difference is that within the satellite audio receiver we have certain refinements which are not found in the TV versions. We also saw that a receiver designed for TV use is no good for narrow band audio use, and why.

With the growth of the services using satellite for radio networking and news feed purposes, the possibility that a market may exist for stand-alone 'ARO' (Audio/receive only) in the private sector is intriguing. The further possibility that an audio receive equipment package might be as appealing to TVRO system buyers as say the stereo audio processors from firms such as Arunta and R.L. Drake is also intriguing.

### A USER Friendly Receiver

The entire marketplace for ARO systems to date has been professional. This is an important consideration since the professional user typically employs a professional (as in trained or trainable) operator for the equipment. It is also important to remember that a radio station using satellite signal delivery installs an sFMs receiver, **sets** it on a **specific** transponder, and **walks away**. Other than routine maintenance and checks, the receiver never leaves that single, individual, 60 kHz wide FM/SCPC signal again.

Early receivers were designed so that you changed frequencies inside of the receiver; if you were affiliated with Mutual, your receiver came out of the box either internally 'tuned' or 'crystal-locked' on a single carrier frequency. If you were affiliated with NBC, the factory sent you a receiver tuned to a different FM/SCPC channel (although both Mutual and NBC use the same satellite and same transponder, the individual service frequencies within the transponder differ).

Later receivers went to a thumb wheel or even continuous tune format. This allowed the operating technician to change his program source by dialing up a different FM/SCPC service frequency at least within a single transponder. And still later receivers gave the operator control over **both** the transponder **and** the service frequencies within the transponder. We will look at such a receiver and how it works, here.

Still, the intended user was a technical type person operating in a professional environment. He was not an at-home 'audiophile' looking for the National Public Radio opera broadcasts or a sports nut bent on following the Minnesota Twins via their satellite delivered radio network from far-away California or Florida.

While all of this was happening at home in North America, there



was another similar scenario occurring outside of the USA. As many dealers are aware, many of the African, Middle Eastern and South American nations rent all or parts of transponders from Intelsat for the purpose of distributing their national television (and radio) 'network signals' from their origination points to surrounding population centers. Lacking the Bell type landline or terrestrial microwave interconnecting ability, they found that the quickest and least expensive way to tie the full nation together was to shoot the national signals to a satellite, and then install downlinks at the required sub-population centers.

When you rent or lease transponder space from Intelsat, the international carrier sets the rules; and that includes all of the technical parameters. It turns out that quite often they will not transmit the television program audio on a subcarrier **with** the video. They will treat it, for engineering reasons, like a stand alone FM/SCPC signal, and they will carry it separately. This may be done on the same transponder as the video (**example:** Peru operating on Intelsat at 27.5 west; the video is sent in a half-transponder format in the bottom 'half' of the transponder while the audio is sent as an FM/SCPC signal well up in the top half of the same transponder). Or, it may be done on an entirely different transponder (**example:** Colombian television transmitted on Intelsat at 34 west uses transponder 1 for the video while the audio is FM/SCPC on transponder 14).

Since the video and audio are not together, in the standard subcarrier format, it is obvious that you cannot use a standard TVRO receiver to recover both the audio and the video. In fact, as long as the audio is not a subcarrier, you cannot use a TVRO receiver for the audio at all; you **must use** a FM/SCPC receiver.

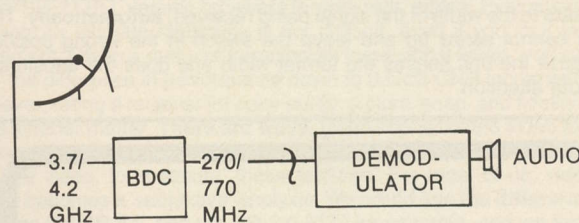
This means that you will end up with two receive systems in the package; one that is tuned to the video transponder (with the appropriate half or full transponder wide 'IF' for the video), and another that is tuned to the audio transponder. This can be done with either a pair of single conversion receivers using isolators at the dish to insure that the two receivers do not 'talk with' or interfere with each other (splitting the incoming signal with a 2-way 4 GHz splitter), or a single block down conversion converter followed by a pair of receivers, each with the independent ability to 'tune-in' the required transponder.

**HERO Communications** (2470 W. 8th Avenue, Hialeah, FL 33010; 305/887-3203) began supplying the special FM/SCPC receivers because of a large contract job in the Middle East. As we learned in February, many of the Intelsat leased national TV services do not transmit their television program audio as a standard TV subcarrier; in fact, often the audio is transmitted on a separate transponder altogether! The same technology which is required for the construction of FM/SCPC receivers for radio network reception from domestic satellites applies to the Intelsat audio-separate-from-video service. When the basic Hero receiver was designed and operational in the Intelsat system service, it then became a matter of transferring that technology to a receiver which would perhaps be more cost effective for the domestic services.

The **Hero Model SCPC 66** receiver is a rack mounting professional grade unit designed to go into a professional installation. It is in production and is readily available as a stock item. The price may be a tad high for the normal 'prospective' home installation, however; \$1750.

CSD/2 began evaluation of the SCPC-66 in January. It has been in daily use since that time and here are our observations.

- 1) The system functions as shown in the **accompanying drawing**. A standard dish plus LNA feeds signals from the desired satellite (and polarization) into a block down converter. This is the AVCOM BDC unit which is a part of the AVCOM 66 series of video receivers. The whole 500 MHz wide satellite band (3,700 to 4,200 MHz) is then carried indoors in RG-59/U type cable to the demodulator proper.
- 2) Inside of the demodulator we have the support circuits for the BDC including the 270/770 MHz IF system. Out of this UHF frequency range IF we have a second IF at 70 MHz.
- 3) The 70 MHz IF is actually a 40 MHz wide region that extends from 55 MHz to 95 MHz and the center is off of 70 MHz slightly (75 MHz). The 55/95 MHz IF feeds into a special FM receiver which is designed to tune the frequency range of 55 to 95 MHz.

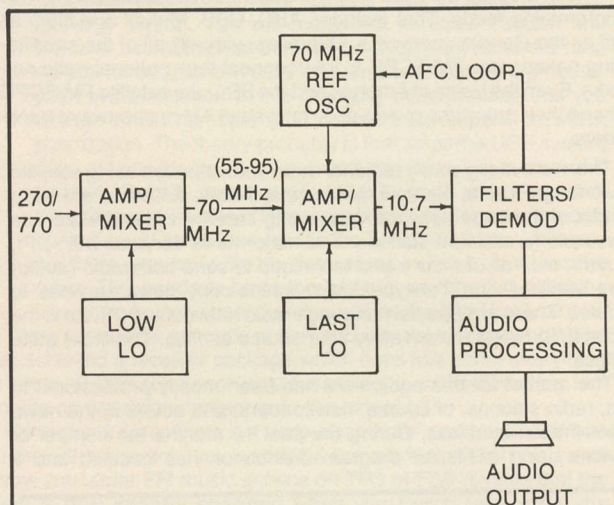


**HERO SCPC-66 SYSTEM USES TVRO TYPE TECHNOLOGY REFINED FOR ARO APPLICATIONS**

- 4) The FM receiver is designed for the 60 kHz wide, 200 kHz spaced services which one finds on WESTAR 4, for example. Inside the FM system is yet another conversion stage which transfers the frequency that has been tuned by the tuneable 55-95 MHz receiver to a final IF of 10.7 MHz. This is the standard IF for most 'FM' broadcast receivers in the world today.
- 5) The 10.7 MHz IF has 'crystal filtering,' very sharply tuned circuits which pass just one of the FM/SCPC carrier signals at a time. The 10.7 MHz signal is amplified, filtered, processed and demodulated. The result is an audio signal which is of exceedingly high quality with a signal to noise ratio that matches commercial standards.

There are other tricks in the receiver, mandated by the technical parameters of the FM/SCPC service. A clever 70 MHz referenced 'AFC loop' keeps the very narrow band signals from 'drifting' out of the receiver passband. This means you can tune in a service/station and walk away, comfortable that when you come back hours or days later, the station will still be tuned in. There is also an innovative energy dispersal waveform circuit to knock out the uplink induced 'dither' which FCC rules require all uplink transmissions employ to the satellites. The final audio signal is 'deemphasized' per FCC (broadcast) standards so that the audio can be directly fed into a (terrestrial) broadcast transmitter for local service.

**The SCPC-66 model unit is not designed for normal home**

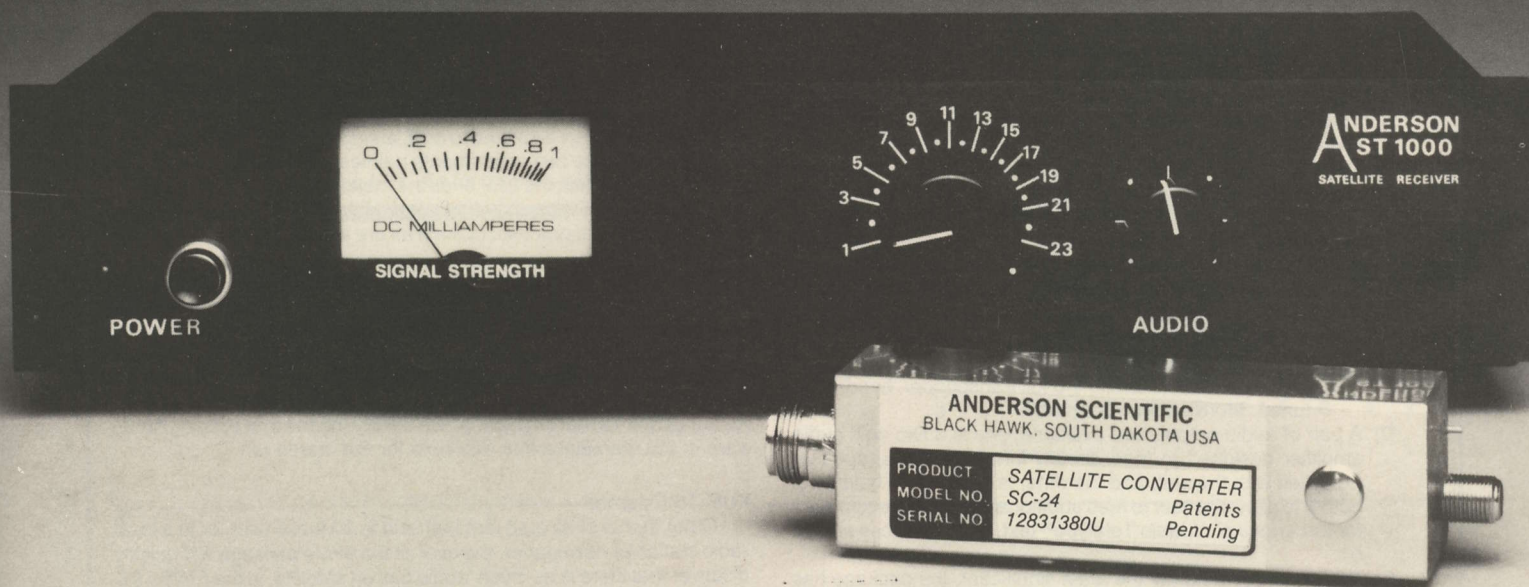


**HERO SCPC-66 DEMODULATOR TUNES 55-95 MHz TO PRODUCE SINGLE SIGNAL AT 10.7 MHz 'LAST IF'.**

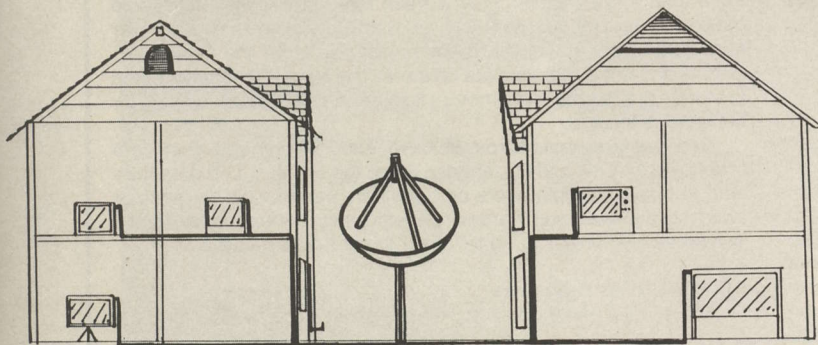


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**use;** the price aside, it has been created for specific 'set and typically forget' operation. The user (an Intelsat receive system or a domestic radio station or newspaper taking a satellite feed) typically dials up the one FM/SCPC sFMs channel required for the installation, and walks away.

So we prepared a list of recommendations to Hero and the result is a new series of 'consumer grade' receivers (yet without model numbers as we go to press) with some 'user friendly' features which should for the first time take FM/SCPC out of the big buck (well, big-big buck!) class, and put it down where a typical consumer/home user can now enjoy the many services available.

- A) **The block down conversion approach**, employed in the commercial version, is now optionally available with a standard single conversion down converter. This makes the system more compatible with the typical home TVRO installation.
- B) The rack styled receiver is now in a stand alone consumer styled package (which we have not seen as this is written).
- C) The SCPC-66 professional grade receiver assumes the operator of the system will be a technical-type person. A pair of initial set-up adjustments under the top lid of the receiver have been brought out front. A meter which is used in the professional grade receiver to properly tune in the individual carriers has been replaced with an easy to read and understand LCD (liquid crystal display) four digit display which serves two functions:
  - 1) It tells the user when he is proper 'center tuned' on the individual FM channel, and,
  - 2) It tells the user where in the full transponder 'band' he is tuned. More about this shortly.
- D) A pair of audio outputs are available; one is a two-watt audio amplifier designed to feed directly into an external speaker (supplied with the unit) and the other is a 600 ohm 'balanced' output to allow the user to feed additional peripheral equipment for the 'copying' of radio Teletype® text, news services and so on.
- E) And finally, and hardly the least significant, the package has been reduced in price in the consumer format so that for \$995 (suggested retail) the home user can add an entirely new dimension in high quality news, entertainment and information 'audio programming' to his TVRO.

Or, his stand alone 'ARO.'

Now it happens that many of the users of this particular transmission format are getting by very nicely with some extremely small dish systems. Muzak (one of the many available here), for example, goes typically to **four foot** (and even smaller) dishes on a commercial basis! That means that with the Hero consumer style SCPC-66 receiver you could be out there selling and installing high grade satellite audio reception systems with some very tiny dishes.

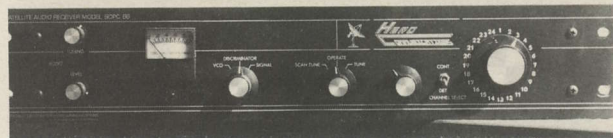
#### OPERATION

As noted, the professional grade SCPC-66 receiver may not be desirable for the average consumer user; unless this was one of those installations where the dealer was going to put the unit in, tune in the receiver to the proper audio or data service channel, and then walk away leaving the receiver in one dial position. **The average consumer** is going to treat the system just as he treats his AM or FM radio; there is a 'dial full' of stations there, some carrying news, some carrying sports, some weather and some music. He is going to want to follow the Minnesota Twins baseball team in the afternoon (using the Minnesota Satellite Radio Network) and attend a concert from Carnegie Hall on NPR radio that evening. The professional grade receiver requires that the user 'remember' where each station is without benefit of an accurate frequency read out dial.

The consumer model has a four digit meter on the front panel and as you turn the tuning knob the liquid crystal displayed numbers change. Those numbers relate to the frequency of the signal being tuned in and the user is supplied with a series of pre-printed cards which slide into a holder on the front of the receiver. There is a card for each transponder (i.e. TR1, W4, TR3, W4) and space for the user to 'log in' the digital meter reading that corresponds to each station tuning position.

The same meter is also used for two other purposes.

Because of the 30 Hz waveform energy that some (all are re-



**HERO SCPC-66 receiver is professional grade rack mounting unit. The front panel meter is replaced with a four digit LCD display on the consumer version.**

quired; many **do not** comply with FCC regulations) signals carry, there are two initial set-up adjustments which the dealer must make when installing the receiver (this assumes the dealer will install it; that the consumer will not be asked to do it, although in truth he could). The meter makes these two adjustments painless. Then after the adjustments have been set, the user finds the meter handy for 'center tuning' of the signal; just like you have on some of the TVRO video receivers, or the stereo signal processors such as are available from R.L. Drake and Arunta.

The transmissions from the special satellite feeds are 'high fidelity,' but **not in stereo**. Well, let's correct that. Some are in stereo (NPR, for example) but to create the full stereo effect, you would have to install a **pair** of these receivers so that both the L (left) and R (right) channels could be independently received and fed to a stereo amplifier system. Most of the stereo services (other than NPR) are found on the subcarrier format anyhow, which simply means that existing hardware in the marketplace is available for the stereo fan.

#### FUN To Operate

Other than a dedicated terminal sold to a Muzak user, or to a local radio station or newspaper, the user of the sFMs package will quickly discover that there is as much 'audio fun' on satellite, in the FM/SCPC mode, as there is 'video fun.' Virtually every major league baseball team now has a satellite connected radio network service; that means that you can be a Montreal fan in Los Angeles or a Los Angeles fan in Florida (or the Bahamas) and never miss a game. Reception is studio quality, and because the listener is 'inside' the radio network feed, it is the audio equivalent to tuning in direct back feeds on video of sporting events.

All of the radio networks supply their affiliates with multiple newscasts per hour. Between Mutual, ABC, CBS and NBC you are never more than a few minutes from a fresh radio newscast. State radio networks abound; you can stay up with Florida news in Maine or Minnesota news in Texas. Special news feeds for the Caribbean, Central and South America are up there. The Naval Observatory time (accurate to a few parts in a million) is there. A 'talking book' service for the blind is there.

Services are spread across W3, W4, and F1R primarily. Service is scheduled for F2R and G2, shortly. Since the uplink or bird operators tend to bunch multiple users onto a single transponder for ease of switching and maximum transponder efficiency, there is not much of a 'fishing expedition' required to locate those that are active.

#### CONFIGURING A System

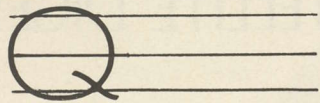
There are several ways to plan a system such as this; the best design will depend upon the user himself.

If the user is casual, and he is willing to **share** the FM/SCPC with the TV function of the dish, a single down converter used for the TVRO and ARO system would work; a switch or relay installed in the RG-59/U line coming from the down converter to the TVRO receiver would allow the user to switch off of the TV service and onto the ARO service. The down converter would be powered by either the ARO unit or the TVRO unit; that unit would be left on fulltime regardless of whether the user was watching television or listening to satellite fed radio.

If the user was interested in joint TV and audio use, a pair of down converters with a 4 GHz two-way splitter at the dish, and parallel runs of RG-59/U would be installed. What is wrong with this approach is that when you are on Westar 4, TRs 1 or 3, you would be limited to the horizontal transponders on W4 for TV at the same time (PBS is there).



# BEFORE



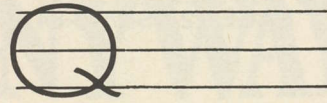
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When you were on F1R or G2 or F2R you would have very little (if any) TV to simultaneously watch.

A stand-alone 4 to 6 foot dish, dedicated to the ARO system, would make a good 'second dish system' for the ARO enthusiast who wants totally independent radio reception without having to interrupt the TV function on the (larger) TVRO dish.

**The future of FM/SCPC is bright.** Since the service requires far smaller signal levels to function, considerable dish savings are possi-

ble. Even overseas, it appears that Intelsat carried FM/SCPC circuits with the likes of the BBC, Voice of America et al would be very well above noise margins on most circuits with dishes **down to 13 feet in size.** Within the domestic service areas, dishes to 4 feet are in regular use by the likes of Muzak. The HERO Communications approach to FM/SCPC reception, at the consumer level, is a pioneering effort. Doubtless if there proves to be an interesting market here, others will follow.



DISH  
IT OUT!

### ON THE TABLE: "Is the role of the TVRO Distributor in danger of being eliminated?"

#### THE OPPORTUNITY TO SPEAK OUT ON ISSUES FACING OUR INDUSTRY TODAY.

It has been noted by those who keep track of such things that the role of the TVRO distributor has changed drastically over the past three years. And there are some who see the distributor as a temporary 'aberration' on a landscape littered with the dead hulks of an era passed by.

Is the TVRO distributor on the endangered species list? **CSD/2** went to our 50+ board of 'advisors' to ask them to comment on this month's industry issue. Our premise was many-fold.

- A) TVRO distributors originally developed because it took the buying abilities of a substantial volume equipment mover to acquire the necessary bits and pieces which the installing dealers required for a typical installation. This was in an era (1980-1982) when no single company marketed all of the home TVRO parts in a single package. **Channel Master**, and others, would change that for all time.
- B) TVRO distributors next went through a period when they seemed to dominate the marketplace; "the big ten" could make or break (it was said) a new product's entry into the marketplace by simply ignoring the product. If the product seemed poor, if the deal seemed 'wrong,' new OEMs found it tough to 'break into' the marketplace with new products.
- C) Today there are between ten and 15 'big' distributors, each of whom average upwards of 1,000 complete TVRO terminals per month through their warehouse turnstyles. Some of these distributors have become involved in private labeled hardware; parts of systems or total systems which bear their own

marketing name. Often these 'private-labeled' products are nothing more than other well known products with a new nameplate, or a different shipping carton.

Depending upon whom you talk with, and their real grasp of the marketplace, it is generally believed that the 'big ten' distributors control the movement of perhaps 55-60% of all TVRO hardware per month, nationwide. Each of these large distributors operates independently, of course. They are often competitors in the marketplace for the same dealer dollars, and the 'spirit of competition' runs high. Still, as a group, **they do communicate** amongst themselves and **they do enjoy** a certain amount of cooperation between one another. Each feels his (or her) role in the marketplace has been instrumental in the development of our present TVRO dealer network.

TVRO products have followed virtually no pre-laidout pathways from OEM to dealer. Virtually all other TV related products move to the seller/dealer through established electronic 'parts house' chains. Channel Master, with a wealth of experience in TV related products and a history of making 'parts house distribution work' for them, initially sought to break into the TVRO marketplace by selling to the established 'parts house distributors.' Nearly two years later, when TV-parts-competitor **Winegard** would move into the marketplace with its own TVRO product line, it would reflect on the limited initial success of Channel Master with the 'TV parts house distributor' group, and move on to a more direct selling approach.

What set the TVRO products aside, distinct from all of the earlier television receiving products? Was it the pricing structure (certainly to stock one TVRO system cost far more than stocking even a dozen elaborate home TV off-air antenna systems)? Was it the 'left-field' approach of TVRO OEMs, coming as many did out of their own laboratories and cocoons with 'no respect' for the 'way things are done' in the TV receiving industry? Or, perhaps, it was that for most TVRO OEMs there were no 'distributors', in the early days, and so they sold 'directly' to **the TVRO dealers**, a group of entrepreneurs who, like themselves, they could identify with and talk to on an about even level.

All of that, or perhaps much of that, has changed in the past 18 months. The TVRO 'distribution system' has stabilized; month to month panic cycles are past for most of the distributors and computer programs forecasting product requirements and product inventory have replaced the 1981ish "Give me 100 of those and 50 of those, every month" hip-shot approach.

So while the distributors have matured, rapidly, and become major profit-driven, customer-service oriented businesses, seemingly the industry's OEMs would be following suit and becoming more and

**How 'Dish It Out' works:** A group of industry advisors, more than 50 in all, are fed selected questions each month. These 'advisors' have the opportunity to respond to the questions or simply 'pass' for that month. New questions for the coming month are mailed in sufficient time to allow participants to think about the questions and respond as they desire and are able. That gets the industry 'dialogue' started. From the answers received, **CSD/2** does some minor editing after passing the responses through a selection process. You read the results of that exercise here. **As a member of the industry, you now have an opportunity to respond yourself to what you see here.** Responses are published in our 'Feedback' column. Ideally, each month there are new questions and new initial dialogue in 'Dish It Out,' and, new industry responses in 'Feedback.' Those who would like to be a part of the initial dialogue, by being included on the 'advisor' mailing list to receive the initial questions, should contact Carol Graba at CSD/2 (P.O. Box 100858, Fort Lauderdale, FL 33310; 305-771-0505).





# ANYWAY YOU LOOK AT IT...

## ADM HAS YOUR ANTENNA!

**AND YOUR TVRO SYSTEM.** Rapid delivery on ADM's super-efficient 11 foot polar mount antenna (includes remote controlled polarization rotation system as well!), plus, packages are available for complete systems including LNA, 24 channel tuneable receiver and cabling. Why wait in a long line when you can get the best, today!

**A SUPER TVRO ANTENNA SYSTEM.** High quality panelized aluminum 11 foot dish and steel polar mount. Dish weighs approximately 200 pounds, mount 265 pounds. Precision designed, easy installation, zinc chromate base primed and heavy duty white top finish. The rotating feed is standard! Easily shipped and installed. Choice openings for dealers and distributors.



**Antenna  
Development &  
Manufacturing, Inc.**

P.O. Box 1178  
Poplar Bluff, Mo. 63901  
(1-314-785-5988)





more adapted to the distributor approach to moving product. Yet there remain substantial firms who continue to 'sell direct' to dealers, who use either no distributors or few distributors in the process of moving hardware. At least one major industry marketing executive, a veteran of all of the above and more, forecasts that **'Distributors are dead; very few will still be in business in two years; maybe 18 months.'** Does he know something that the rest of us do not know? Or is he simply out of touch with the realities of product movement?

Those who believe that the distributor may be dead base their beliefs on two factors:

- 1) The distributor takes a chunk of the profit pie for buying, warehousing, promoting, and servicing the product, and the dealer to whom he sells. That profit chunk varies from 15% upwards, depending upon where in the distribution chain you make your calculation of that number. The premise is that as the industry becomes more competitive, if there are price-wars breaking out, the OEM will look around for additional profit centers to call his own, to make it possible for him to continue to be competitive **with his products.** That 15% (upwards) which now goes to the distributor could be an attractive 'target' and it could and would play a part in the OEM's mind as he studies where he can shave end-of-line costs to remain competitive.
- 2) The distributor does more than warehouse and re-ship; he plays a key part in the packing of unrelated products (feed, LNA, motor drive, dish, receiver, cables, modulator) into single 'system-packages.' The distributor's real strength has been this 'mix and match' approach to business which launched the first real TVRO 'distributor' some four years ago this spring. It is obvious that more and more OEMs are attempting to offer complete one-source packages of TVROs on their own. Channel Master was one of the first (if not the first) to do so; Conifer, Winegard and others have followed suit. Even some OEMs who 'masquerade' as 'quasi-distributors' (ADM, for example) now offer completely packaged systems direct to the dealer. As this approach to packaging strengthens, the posture of the 'mix and match' distributor may be weakened.

If either of these two factors proves to be important over the 'next' 18 months, there is little real evidence that new OEMs entering the marketplace are bypassing distributors **today;** March of 1984. Uniden, or example, entering the industry at this time, expects to deliver upwards of 3,500 complete TVRO receivers (plus LNAs and associated hardware) per month starting within 90 days. Uniden will sell **only through** distributors and they are obviously comfortable with that approach.

Having stated the premise, now the responses and the reasoning from those on our CSD/2 'advisory board' who have taken the time this month to share their thoughts with us.

#### 'ATYPICAL PRODUCT DISTRIBUTION METHODS'

"Often the black and white certainty of a pro and con ledger sheet for choosing a (particular) method of marketing a product does not transfer neatly to day to day business. As the TVRO industry has been anything but typical since its inception, atypical product distribution methods continue to exist.

"The bypass of the distributor in the marketing chain by OEMs is accountable to several factors. By selling directly to the dealers, OEMs can more closely monitor the pulse of the marketplace. Additionally, on a per-customer basis, the impact of a 'lost account' is less when selling to numerous dealers than it might be by selling to a handful of distributors. Early on (in this industry), this may have been the type of security required by (new) OEMs. Nevertheless, as the TVRO industry matures, there are significant reasons to support a distributor based network. In fact, many OEMs who now sell to both dealers and distributors are in the process of (switching to) a distributor-only plan.

DAN BERGE/SHEILA LYNCH

CONTINENTAL SATELLITE SYSTEMS

**"Perhaps the most crucial reason is that of per-unit cost.** By producing and shipping in large quantities per order, the manufacturer is able to reduce his costs. These reductions in cost can be passed to the dealer through the distributor, enhancing the ultimate appeal of the product.

"Large orders from distributors improve the manufacturer's ability to forecast future demand. Material flow is improved and production schedules are less erratic. This results in reduced inventory costs as the distributor assumes the role of stocking for the limited-quantity buyer. Shipping costs and lead times are also improved dramatically; the distributor is able to carry 'more clout' with the manufacturer and he is far better able to 'go to bat' for a dealer, if needed, than the dealer would be on his own. A reputable distributor has taken the time to put together a knowledgeable staff to offer the dealer the technological 'know-how' necessary. And in some situations, the distributor is able to offer interim, short-term financing to a dealer caught in a cash-flow crisis.

"As short-term business strategies ripen into long-term goals, the distribution network for the TVRO industry is, itself, becoming more solid. Industry growth was, and is, so fast paced that responsible OEMs are taking the time to assure that the distributors they select for their product can supply the framework and stability required to give the dealer and the end user both service and satisfaction."

#### "... THE PROS OF SELLING DIRECT ... FAR OUTWEIGH THE CONS ..."

"Low cost antennas where assembly is reasonably idiot-proof are best suited for sale through a distributor. Higher-priced antennas and/or antennas that require specialized installer training can sooner or later haunt both the dealer and the manufacturer.

"For us, the pros of selling direct to dealers far outweigh the cons. As a practicing installer, this writer places a high priority on design features which will afford the installer maximum control over antenna precision. These very same features are often very frustrating to the 'novice installer.'

"Long ago we learned that the TVRO world is made up of 'antenna men' and 'receiver men.' The dealer whose installers are 'receiver men' should select antennas accordingly, or they will suffer the consequences. Some dealers would be better off turning the antenna installation over to an outside contractor who knows what a properly assembled antenna should look and work like. While back in Illinois over the recent holidays, this writer overheard an employee for a large scale MSO bragging about having assembled a 5 meter TVRO in 5 hours. When asked whether he checked the antenna, during the installation process, for 'rim integrity,' he replied 'Rim-what???'.

"When the antenna designer builds in various methods of insuring that the installer has ways to prove to himself that the antenna is functioning properly, after assembly, 'antenna men' are pleased. On the other hand, the same features on the same antenna seem like a great deal of unneeded frustration to a 'receiver man.' Anyone who has been in this industry for a reasonable length of time is aware of the 'antenna men' versus 'receiver men' dichotomy. This is not a new aberration; it goes back to the 50's and 60's when people were designing and installing huge 'tropo-scatter' curtain reflector systems for distant VHF television signals to feed cable television systems.

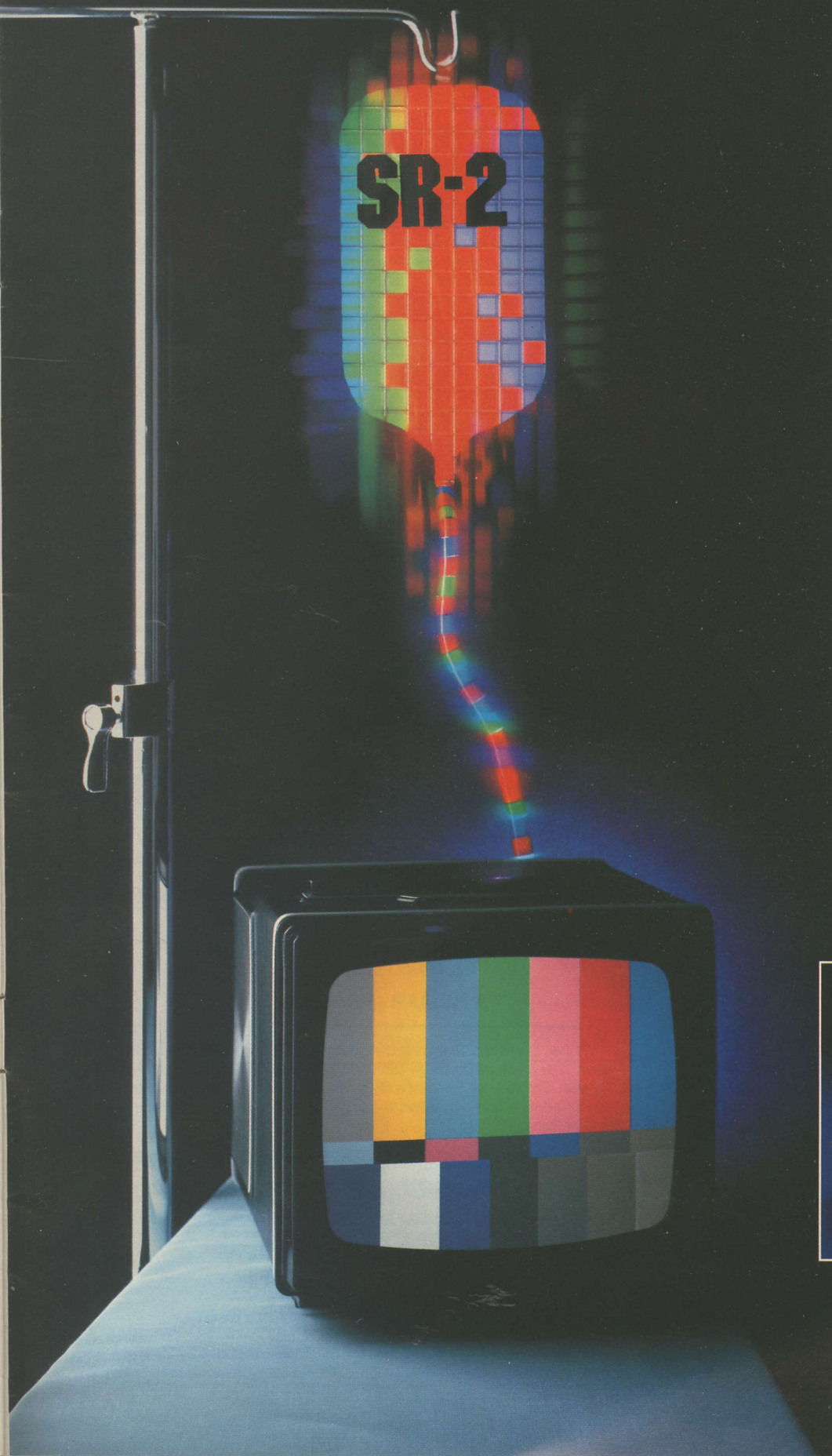
J.K. (JIM) VINES

PARAFRAME (ANTENNAS)

**"Antennas larger than 4 meters should be installed by experienced 'antenna men.'** There is a definite need in the TVRO industry for the distributor. But from our perspective as a manufacturer of a skill-oriented antenna line, a distributor link-up might at most include the sale of an installation along with the antenna proper. When the dealer rarely requires a large antenna array, such as we specialize in, it is very difficult for him to acquire the background and kind of experience which is unique to large TVRO antenna assembly.

"The pros and cons (for both manufacturer and installing dealer) of going through a distributor have to be very carefully weighed. As we





## The SR-2. Advanced therapy for a healthier picture.

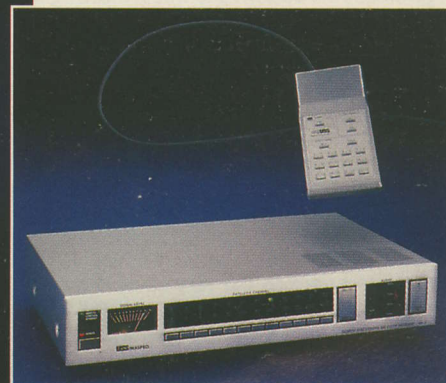
Your customers want a proven prescription for a crisp, clear picture with distortion-free audio. Now you can give it to them with the new second generation SR-2 Receiver System. It's the break-through Rx.

**The SR-2 contains** a break-through ingredient we call LPLL, the Linear-Phase Lock-Loop Circuit. In the past, LPLL has been found only in commercial electronics. But now, LPLL is the key in providing the video demodulation necessary for a brilliantly healthy picture, noise remission and improved threshold performance.

**The SR-2 also relieves** other annoying reception symptoms your customers may experience. Our Automatic Video-Gain Control maintains consistent picture brightness no matter what transponder is selected. And the Priority Polarity Control provides maximum signal strength.

**For happy customers with** a healthy outlook on satellite reception, give a dose of the SR-2. It's a totally integrated electronics package, including remote control that's user friendly in operation and installation.

*To give the SR-2 your own personal examination, call us today at (800) 328-7733. In Minnesota, (218) 681-5616.*



UNITED  
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have seen, the factors include the type of antenna being selected as well as the predisposition and/or ability of the actual installer. Supplying supervision for the novice installer of large TVRO antennas is very important; whether the location is domestic or foreign."

#### "THE DISTRIBUTOR WANTS TO TIE UP THE LEAST AMOUNT OF MONEY . . ."

"The question of sales from OEM to dealer or OEM to distributor is a mixed bag. **Selling through a distributor certainly provides the OEM with less red tape, less hassle, and fewer people to deal with.** Distributors buy in larger quantities; that is one of the reasons they are in fact distributors! On the other hand, the distributor naturally wants to tie up (a maximum amount of) product by getting the absolute bottom dollar price. At times, perhaps, quality may not end up being paramount when the price he buys at is shaved a few dollars a unit. A few dollars a unit can mean thousands of dollars saved for him when he purchases in large quantities. The dealer, on the other hand, buys fewer units at a time but he hopefully wishes to assure his customers of top quality above all other considerations.

JOHN KAUL

KAUL-TRONICS, INC.

"We operate our business with both distributors and dealers buying from us. We have found good working relationships with both. And we see nothing in the immediate future which will change this arrangement."

#### "THE MARKETPLACE HAS PROVEN DISTRIBUTORS TO BE NECESSARY . . ."

There is no need to justify the role of a distributor because the most severe judge of all, the marketplace itself, has proven time and time again that **distributors are necessary and desirable.** Let's review the standard arguments in favor:

- 1) Distributors reduce the number of individual customers the OEM must contend with;
- 2) This frees up the OEM to do what he knows how to do best; engineer new products and produce those products with maximum emphasis on price and quality.

"In these days of 'Megafactories,' such as in the auto industry, many manufacturers seem to see their role as much larger, seeming to want to 'direct' and 'lead' the industry in their own mold, rather than responding to requests from customers as to what is needed and wanted in the marketplace.

"Manufacturers tend to become obsessed with quantities, often to the extent that they will put a single-order on a far back-burner so that they can ship out the 50 and 100 quantity orders. This of course alienates the customer to whom that single unit order was very important.

"A feeling of familiarity and ease with the product on the part of the installing dealer often fails to develop because of a lack of liaison directly with the manufacturer. A simple thing like a telephone call often seems formidable when the distance involved is great and the cost of the call becomes a factor in these days of thinning profits.

"But most important to most dealers is the matter of stock. For many reasons, a manufacturing company does not often perform to the standards our stereotype image suggests. Equipment simply does not 'pop off the line' every 8 seconds, 24 hours per day, with the regularity of a finely tuned machine. Why not? Simply because the manufacturer has the very same problems that everyone else has! People get sick, a compressor breaks, one of the key suppliers of raw parts goes broke, somebody misreads a parts order and substitutes a different part, or changes a key quantity. Phase lock loops are all being used up in computers, or whatever.

"The net effect is that when Joe Dealer calls up and wants one or two widgets, the factory may not have them, and may continue not to have them for several weeks or months. We all know what this can do to a dealer's position in a particular local market; the customer goes down the street to the competition and buys a competitor's widget.

Simply because the competition can deliver and install 'next Saturday' rather than 'sometime after the first.'

"I believe **the key function of the distributor is to 'interface,'** or buffer, the often very hard line taken by a manufacturer, and to soften that line to the point that a dealer can continue to sell that manufacturer's product profitably.

"First, it is necessary to input to the manufacturer what is needed and wanted in a coherent fashion. The distributor does this by gathering and filtering the input from his dealers, and then passing it on in intelligent fashion. This tends to eliminate the frivolous requests, this **should** be appreciated by the manufacturer, and is a service that is performed on a regular basis by distributors.

"Secondly, it is far easier (I believe) for a distributor to respond to a dealer's request when the dealer may represent a more significant portion of the distributor's income than the dealer would represent of the OEM's income. The dealer also tends to be closer to the distributor, geographically, which should add to the attention that he gets.

"Thirdly, there is a pipeline here which flows both ways. The dealer is able to get 'inside information' about the product from the distributor more easily than from the manufacturer. The manufacturer is either apt to be overburdened getting accurate, high-speed data to a multitude of dealers, or, he is reticent about giving out information to a multitude of dealers for fear that 'somebody will find out'; i.e. a competitor.

"However, none of this really matters if the matter of 'stock' is not carefully handled. Most dealers are not prepared to handle large quantities of stock. There are financial and logistic reasons here. Antennas seem to be the most difficult item in this industry for stocking, and they therefore probably account for the considerable number of 'regional distributors' we see in this business today. If you have never seen 100 or 500 antennas 'in stock,' or have not priced the cost of a lift-truck lately, you might not understand. However, everyone understands a \$ with 6 numbers to the right. So since it is not practical for dealers to stock products in such large numbers, 'second best' is for the dealer to know where they can go to get one or two or even five-ten of the product; even if the manufacturer's compressor has broken, or all of the available chips have been used in somebody's disk drives or somebody else has placed a 100 unit order. It is important that the dealer be able to call and obtain immediate delivery since a large portion of the dealer's sales fall into the 'impulse buy' category. The dealer cannot stand any delay and the distributor, a buffer between he and the manufacturer, should be able to 'absorb' the dealer's needs efficiently. The distributor simply relieves the manufacturer of stockpiling quantities of products which may be needed without advance anticipation. On the other end, the distributor is able to 'take product' for warehousing during periods when the production capacity of the OEM exceeds the instant demands of the marketplace.

BILL MILLER

PROMAR (MARKETING)

"Last, but hardly least, the distributors can provide a good, routine cash flow because of large advance payments flowing in a regular fashion. Overall, the presence of the distributors enhances the quality of the industry and increases the total volume of sales, both in units and dollars."

**WHAT IS MORE  
FRIGHTENING  
THAN COOP ONCE  
PER MONTH?**

Details on page 13.





## NEW PRODUCTS/ continued from page 9.

Model 6129 features push-button channel selection with a polarity switching system. A fine-tuning control and a signal level meter are included. The receiver also has variable audio sub-carrier tuning. Model 6130 includes automatic polarity switching, push button as well as manual audio sub-carrier tuning, LED signal strength metering, a center tuning meter and a channel scan button for full 24 transponder cycling. The 6130 also has a remote control unit for channel selection and powering functions. Packaged with the new Channel Master 8 foot fiberglass antenna, the 6129 carries a basic suggested pricing of \$1895 while the deluxe 6130 system with a 12 foot Channel Master dish is priced at \$3995.



CHANNEL MASTER 6130 receiver

**DEXCEL** (Division of Gould, Inc., 2580 Junction Av., San Jose, Ca. 95134; 408/943-9055) is scheduled to introduce its new economy priced DXR-900 receiver at the March 18-20 SPACE show in Las Vegas. The DXR-900 consists of the receiver, a 125 foot pre-assembled cable package, the (DXS-1200) low-noise amplifier and downconverter (LNC). The DXR-900 has a full two year warranty, a built-in Polarator 2 control, built-modulator.

**DRACO LABORATORIES, INC.** (1005 Washington St., Grafton, Wisconsin 53024; 414/377-0770) reports they are now shipping their 'Sparklie Filter' device in quantity. The unit operates as a 70 MHz IF filter, installing between the down converter and the input to the 70 MHz satellite TVRO demodulator. The unit narrows up the basic IF passband of the receiver, providing 'enhanced threshold' to the system for receivers which do not have IF passbands that have been optimized for the best trade off between receiver sensitivity and video fidelity. F input and output connectors allow the unit to be installed just ahead of the TVRO demodulator, indoors. **Users are warned** to verify that the receiver system they intend to offer the Sparklie Filter with is compatible with the filter design frequencies of the unit.

**MICRODYNE CORPORATION** (P.O. Box 7213, Ocala, Florida 32672; 904/687-4633) has signed an agreement to supply \$300,000 in 12 GHz TVRO terminal equipment to the new CATV marketplace in the United Kingdom through U.K. distributor Anixter-U.K., Ltd. The order covers 70 of the Microdyne 1100BDC-12 block down conversion downconverters plus 90 of the model 1100DCX-12 receivers. The receivers cover the 10.95 to 11.7 GHz frequency region and are programmed for up to 72 channels of reception.

## PUBLICATIONS/Learning Aids/Studies

**SMATV BASIC** by Dr. Robert Burull (Burull Communications, 2042 Spring Rd., Stoughton, Wisconsin 53589; 608/873-4903) is a new manual prepared to instruct you in a wide variety of SMATV operational problems. Covered is 'SMATV Marketplace,' 'Understanding The SMATV Product,' 'SMATV Legality,' and 'The SMATV Market.' **SMATV ADVANCED** is a second publication in this series covering 'SMATV Facilities,' 'SMATV Financing and Pro-Formas,' 'SMATV Contracts and Contract Strategies,' 'SMATV Programming Tactics,' and 'Developing Programming Packages.' The same company provides an SMATV 'marketing program' with sales aids to assist the SMATV operator in achieving maximum penetration of his

NEW PRODUCTS/ continues page 30

## International Satellite Television

Your Complete TVRO Supplier for Home or Commercial Application

## COMPLETE SYSTEMS:

**ASTRON 110**, 120° LNA and PR I with your favorite dish.

9 ft. Wilson

**\$1,060**

10 ft. Prodelin

**\$1,358**

12 ft. Conifer

**\$1,458**

**BABY Q with 85° INA** and your favorite dish.

Add \$299 for Programable Jack--Reg. \$339.

9 ft. Wilson

**\$1,195**

10 ft. Prodelin

**\$1,495**

12 ft. Conifer

**\$1,595**

**Luxar Deluxe** Receiver 9550, 120° LNA Motor Drive 9534 • Sensor 9536 and PR I.

9 ft. Wilson

**\$1,858**

10 ft. Prodelin

**\$2,158**

12 ft. Conifer

**\$2,258**

**WIN FREE ASTRON or 110 LNA** with this ad and your business card at the Satellite Electronics Show in Las Vegas, NV., Riviera Hotel Booth #608, March 20, 21 and 22, 1984.

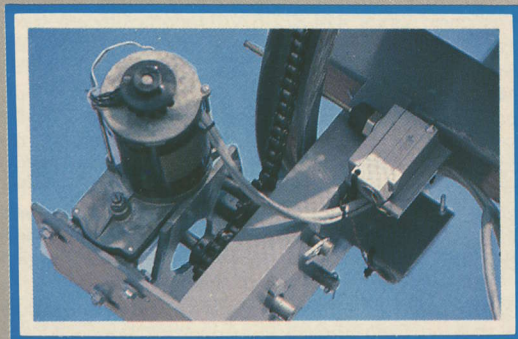
Please call and ask for prices on Commercial Receivers, LNA's and Modulators.

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P.O. Box 242, Fairfield, Iowa 52556  
**(515) 472-3174**

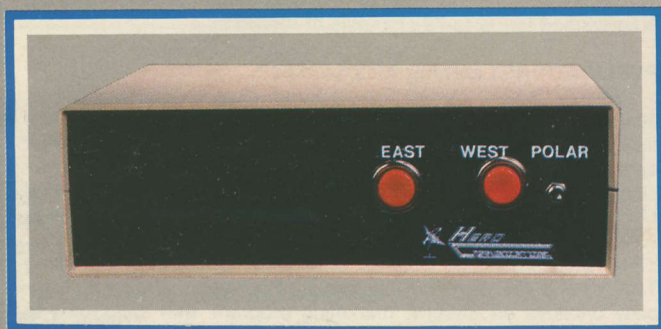


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**LAS VEGAS SPACE  
CONVENTION** for  
more exciting details!"  
Caesar's Palace - March 18-20.

# THE HIGH



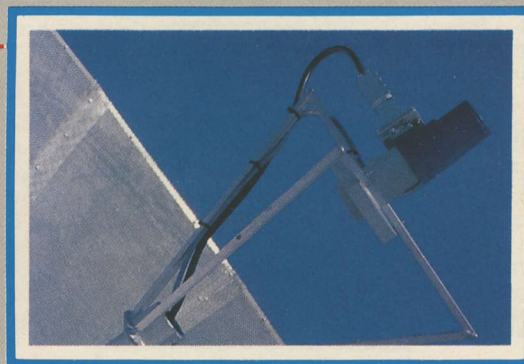
A.



B.

- A. Horizon to horizon motor drive. (uncovered)  
B. HERO digital remote control antenna positioner.  
C. Adjustable feed and LNA mount.

**THE HERO 13** is a full foot larger than the tinker-toy 12 footers. It has strength no tinker-toy antenna ever had, and performance that runs 'rings around the toy like competition! A full foot bigger — a fat 1 dB more gain than the best of the 12 footers. And complete; a horizon to horizon motor drive (your customer's won't miss the new F2R, G2, birds with a Hero antenna!) that brings in true world-class pictures from the FULL arc! Dealer friendly. A complete install kit; special drills, tools are packed with each antenna. You need NOTHING but a 1/4" hand drill, screw driver, and adjustable wrench. Everything else is included. MOTOR DRIVE, digital read out control (with built in Polarotor control) and a self-proofing feed; it checks itself and you KNOW you have maximum gain! No cables to prepare; our MASTER CABLE has all connectors in place; everything 'snaps together' in record time! You can actually install a HERO 13 as fast or faster than the tinker-toy 12 footers.



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**SPACE**  
The Voice of the Satellite  
Earth Station Industry

**And we saved the best part for last. The price!** As low as \$1,195 dealer net in small quantities for a 13 foot system that goes together faster, works better, and looks like a professional installation. Tired of playing with tinker-toy antennas? Graduate to the professional ranks with the HERO 13. If 13 foot of massive gain is too big for your area, HERO 10 offers all of the same dealer and user friendly features in a ten foot, high performance dish; at the even lower price of \$995 for a complete 10 ft. system. A few select dealerships are still available.

\*The HERO 10 ft. and 13 ft. system includes: antenna • polar mount • horizon to horizon motor drive • digital remote control box • 100 ft. of cables with connectors • electromechanical limit switches.

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# PERFORMERS

## FROM HERO



SUPER TENNA 13'

## MAKE YOU LOOK

**KNOWN** the world-around for superb quality international TVRO systems, HERO is now offering the first truly high TVRO antenna systems. This is no panty-waist, tinker-toy professional antenna, built with the technology and expertise of the marketplace. It is significantly better, significantly higher in performance, and significantly easier for you to install!

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illite Corporation, Cedarburg, WI 414-375-1000, Nat'l 800-558-5582, Wisc.  
leo Services, Palenville, NY 518-678-9306. **OREGON:** Von's Total Televi-  
8. **OHIO:** Satco U.S.A., New Philadelphia, OH, Nat'l 800-362-8619, Ohio  
unications Supply, Tampa, FL 813-971-1648. **UTAH:** Video Link, Salt Lake  
Enterprises, Rockwood, TN 615-354-3471. **CANADA:** Ground Control,  
ellite Systems Ltd., Burnaby, B.C. 604-430-4040. Videosat Canada LTEE,  
S: Morgan Satellite Systems, Hughes Spring, TX 214-639-7517.



## NEW PRODUCTS/ continued from page 27

project in the shortest possible time frame.

**CONTINENTAL SATELLITE SYSTEMS** recently completed a thorough analysis of their warranty card registration data and has come to a number of conclusions concerning the present-day TVRO marketplace. The firm finds that the average TVRO buyer is married with an income level between \$25,000 and \$50,000 per year. They found there were two distinct groups or humps in the age pattern; 22% were between the ages of 21 and 31 while 24% were age 50 and over. The same study found that word of mouth was the largest single 'advertising tool' with 27% of those responding indicating they had learned of TVRO from a friend.

## PERSONNEL News

**GILLASPIE COMMUNICATIONS, INC.** has announced that firm founder and the engineer responsible for the Gillaspie line of TVRO products, **Norman Gillaspie**, is no longer an employee of the company. Gillaspie is reportedly in negotiations with the present management of the company and legal counsel has been retained. A substantial share of the firm was sold in 1981 to a Hong Kong venture capital group and since that time the investors have had an increasing amount to say about the operation of the company. A majority of the GCI equipment is now manufactured in Taiwan. Gillaspie can be reached in the interim at 415/854-8987.

## CALENDAR/ Through April 30th

**MAR 18/20:** SPACE (Society of Private And Commercial Earth Stations) Las Vegas spring trade show and convention; Caesars Palace Hotel. Educational seminars, more than 300 exhibits scheduled, industry banquet and entertainment. Call 202/887-0605 for reservations and registration.

**MAR 20/22:** STTI (Satellite Television Technology International) Las Vegas spring trade show; Riviera Hotel. Educational seminars, more than 300 exhibits scheduled. Call 405/396-2574 or 800/654-9276 for reservations and registration.

**MAR 20:** American Bar Association Cable TV Committee day-

long video-conference on legal problems facing cable television industry. Contact Barbara O'Neil, 202/362-1140.

**MAR 31:** Wespercom Group Winter Educational Seminar, Kent, Washington. Call 503/389-0996 for reservations.

**APR 10/11:** SATCOM '84, sponsored by International Association of Satellite Users. Sheraton Hotel, Washington, DC; contact 703/437-5457.

**APR 11/13:** Blonder Tongue SMATV/CATV/TVRO Technical Seminar; Ramada Inn East, Reynoldsburg, Ohio. Contact Betty Karras at 201/679-4000.

**APR 13/15:** SMATV/Private Cable Workshop sponsored by Burrill Communications Group; Milwaukee, Wisconsin. Contact 608/873-4903.

**APR 16/18:** Videotex '84 at Hyatt Regency Hotel, Chicago. Contact 212/398-1177.

**APR 23/25:** NSCA Continuing Education '84 Seminar, Chicago. For details, contact Larry Hannon at 904/237-6106.

**APR 26/27:** Terrestrial Interference Seminar sponsored by Microwave Filter Company, at East Syracuse, New York facility. Contact Bill Bostick at 315/437-3953.

**APR 29-May 02:** National Association of Broadcasters annual convention and trade show at Las Vegas Convention Center. Call 202/293-3526.

## BIRD Activity Report

**96° W/ Telestar 1 (T1):** CBS, now feeding central time zone programming on D3, TR10 may switch to fulltime feeding on T1 during April, leaving D3 for NBC only (TR1); **Also scheduled to switch here** during April is Robert Wold's TR-19 feed from Westar 4. This bird will be the primary 'broadcast TV bird' for ABC, CBS and independently fed program feeds, shortly.

**91° W/ Westar 3.** You can now find FM/SCPC on transponders 1, 3, 7, and 9. Transponders 1 and 7 have the greatest amount of 'FM radio networking' on board.

**99° W/ Westar 4.** You can now find FM/SCPC on transponders 1, 3, and 22 with the greatest loading on TR3.

## COOP TWICE PER MONTH!

## JUST For Fun

The (home) TVRO industry is developing an excellent sense of 'marketing' and tools to help market TVRO hardware are becoming more and more common. One of the 'oldest' tools of marketing is the 'bumper sticker'; that chunk of plastic coated paper with glue that Elmer never invented which once applied seemingly cannot be taken off of the vehicle.

**CSD/2** invites you to send us your own TVRO related bumper sticker for our 'Bumper Sticker Of The Month' contest. We'll go through the entrants each month and publish the most creative, colorful, and attractive entry. Send your entries to: **CSD/2 Bumper**

**Stickers**, P.O. Box 100858, Fort Lauderdale, FL 33310.

This month's winning bumper sticker comes from **SATELLITE ELECTRONICS INTERNATIONAL** of Reno, Nevada. The background is a deep, 'hunter green' (we know it is 'hunter green' because we once had an Austin Healey 100-S sports car which the British told us was 'hunter green,' and the SEI bumper sticker is an exact match for our old 100-S!), and the lettering is the natural white background of the stock material. The heart could only be red; and it is!

**Congratulations to SEI** for being tasteful and attractive with their bumper sticker!

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# Don't Try This Stunt At Home.



Mark Fator, photographer

This was fun. It was a lot of work too, but it was fun seeing if we could actually do it.

It began as a little sketch on the margin of a note pad, and after a great deal of thought and a huge amount of convincing — Mike loaned us his car.

We parked a real live Mercedes Benz 300D on top of an absolutely box-stock Paracclipse antenna.

The 3.8 meter Paracclipse was assembled meshless and placed face down in a shallow pool of water. We fabricated a special steel H-shaped



rack to provide a flat surface at the balance point. The car's forward weight bias was counter-balanced with 300 pounds of steel plate in the trunk.

The total dead weight was 4,522 pounds. Total deflection under load was 1 inch and when the whole ordeal was over, the hub plate was only .45" closer to the floor than before.

Last year, during a "destruction test," we dropped 5,200 pounds of steel stock on the same antenna; so we weren't really surprised when this stunt worked.

What does it prove? Just one thing: We build a very, very strong antenna.

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## Paracclipse

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